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February 19, 1931

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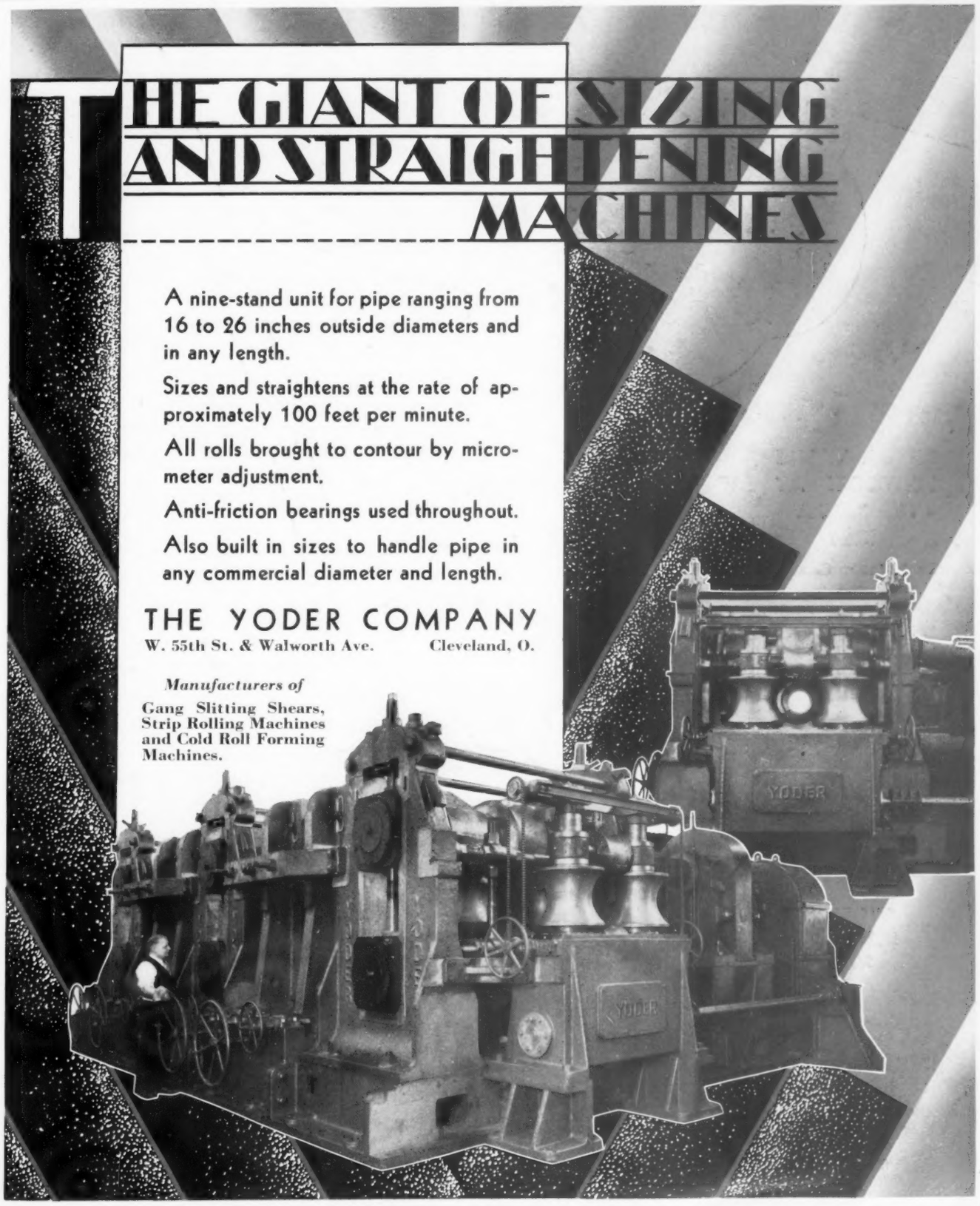

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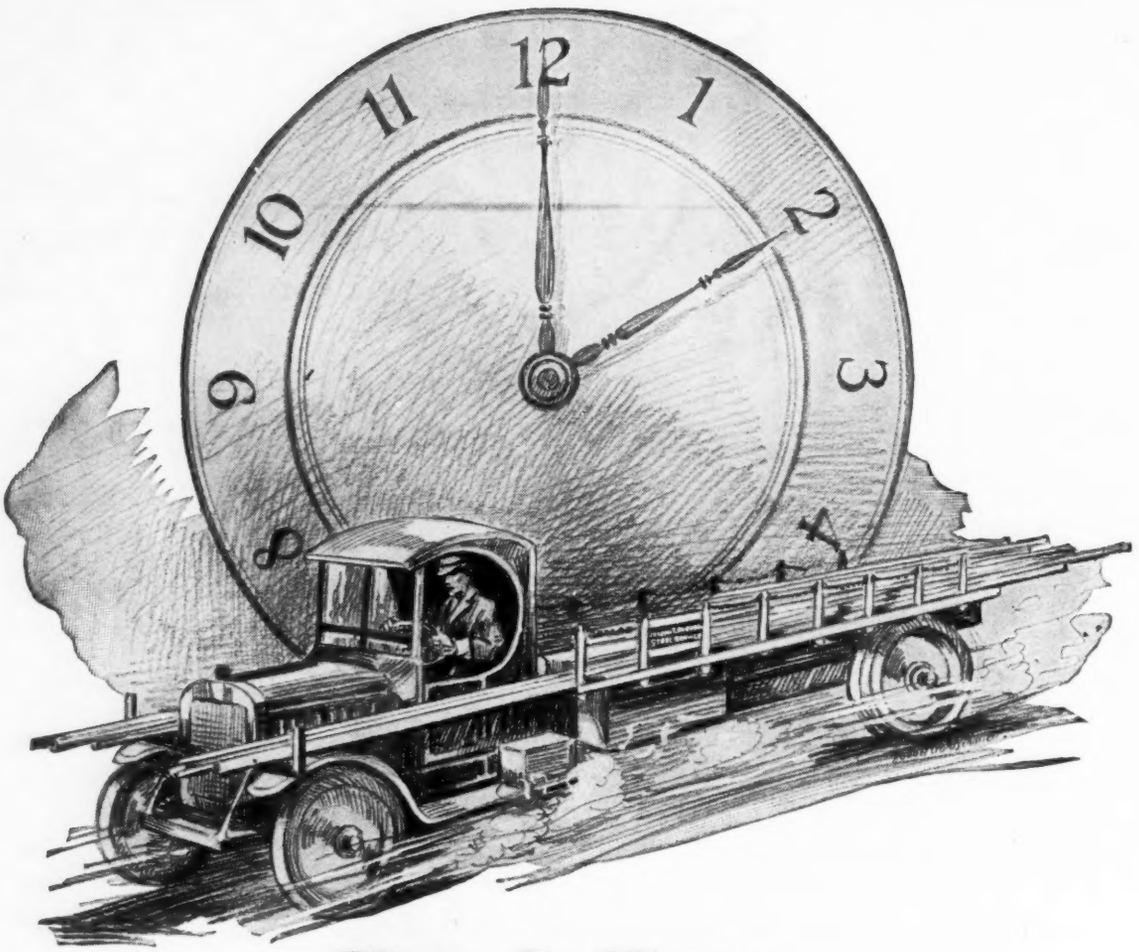

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STEEL-SERVICE

Volume 88 Number 8

STEEL

For forty-eight years—IRON TRADE REVIEW

PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

This Week in Steel

MOSES was the greater part of a lifetime—and they lived long in his day—building himself up to the spiritual eminence from which to utter the ten commandments. After 18 months in the dregs of depression many executives feel impelled to expose the sins of business and point the way to repentance, and, perhaps by the law of opposites, they make Moses their pattern. A department of commerce official submits (Page 18) a decalogue of don'ts which he believes will stimulate business. A trade association executive (Page 27) would amend Moses' code by an eleventh commandment—Uphold the sales price. A canvass of 2034 executives discloses (Page 16) a double decalogue of positive suggestions for righting business, the remedies ranging from revision of the Volstead act to adjustment of gold reserves.

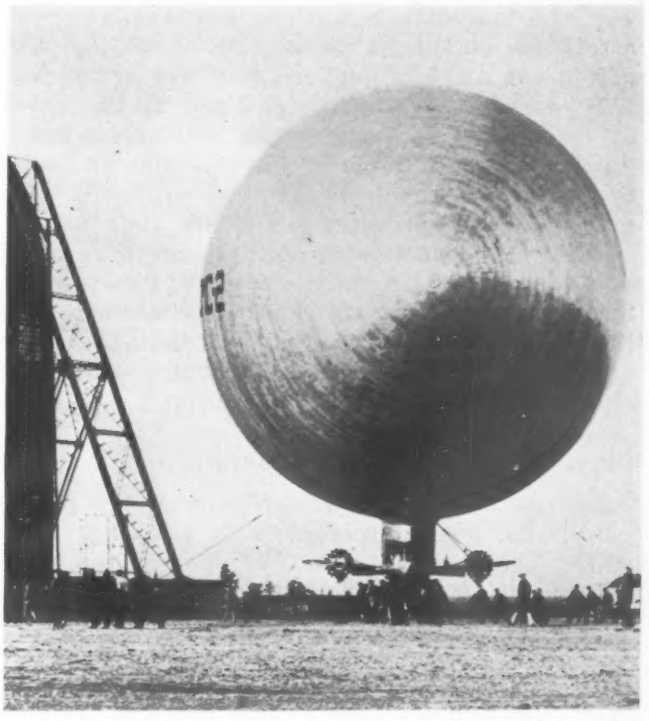
Perhaps it is in spite of a plethora of advice that business continues to convalesce, but whatever the reason progress is manifest. Another mild gain in steelmaking operations putting the industry above 50 per cent, a stock market which has broken through the high of Jan. 8 and registered the greatest degree of confidence since last fall, an adjustment of drought-relief difficulties between the President and congress, greater certainty there will be no extra session of congress, moderate rainfall in the drought-stricken areas, an unusually sunny and open winter, the approach of the season when outdoor work will open up in the South and slowly move northward—all this patently is buoying sentiment.

«Keynoting» for 1931 Conventions Simplified

With a sentiment 99.44 per cent unanimous that business is on the upturn, the "keynoters" at 1931 conventions can direct attention to the expansion ahead and give their colorful adjectives free rein. Already the 1931 convention season is on, and as usual there is a serious side. . . . At New York this week the 140th session of the American Institute of Mining and Metallurgical Engineers (Page 16) is devoting much time to steel problems . . . Greater steel stresses due to wider use of superheated steam were discussed (Page 46) at the Midwest Power Engineering Conference at Chicago. . . . And at the National Western Metal Congress (Pages 15 and 38) nitriding and manganese steel were two subjects.

Manganese, Troublemaker for Steel

For producing the better steels discussed at these three conventions the steel industry is seriously dependent upon manganese, which explains the contention between the steel industry and domestic producers of the ore. Fuel has been heaped on the flames this week by an official treasury embargo on Russian imports of lumber and pulpwood (Page 19), which American manganese interests would have extended



Acme-P. & A. Photo

Station ZMC-2 broadcasting! The ZMC-2, however, is an all-metal dirigible. The navy's latest appears like a huge loud speaker in this unusual angle, at Lakehurst, N. J.

to Russian ore. . . . Were this competition eliminated six large domestic plants would resume the production of manganese immediately, their owners contend (Page 16). . . . Government engineers declare (Page 16) there is sufficient Lake Superior manganiferous ore to meet emergency requirements.

Bolts, Nuts, Rivets Now Take a Bow

For his hall of fame, to which he is nominating those industries which have done much to soften the hardships of unemployment, Col. Arthur Woods, head of the President's emergency employment committee, is partial to iron and steel. Last week he honored the National Association of Flat Rolled Steel Manufacturers; this week he pins the laurel (Page 17) upon the Bolt, Nut and Rivet institute. . . . Government reports show employment for all industries declined 4.2 per cent in January but in steel (Page 18) only 3.2 per cent. . . . A large electrical manufacturer is abandoning all Saturday work beginning March 1. . . . Saturday afternoon off is to be the rule for postal employes if the President (Page 19) signs the Kendall bill. . . . A National Metal Trades association chart aptly depicts (Page 18) the January trend of employment.

No Birth Control for Steel

Unless new uses are developed the steel industry can look forward to only 40 years of growth, provided of course the forecast (Page 15) of a statistician that the United States will attain its maximum population of 175,000,000 persons in 1970 is borne out. Taking the past five years as an average and not giving effect to greater per capita use, this indicates a maximum steel output of 71,000,000 tons in 1970, or 30 per cent over the 1929 record. . . . But new uses are springing up. Now they are installing air-conditioning equipment in railroad passenger cars, requiring (Page 81) several hundred pounds of steel per car, while a new lithograph process developed in England (Page 18) and transplated to this country uses steel sheets instead of zinc or aluminum.

Now Weld Steel Pipe Spirally

Still another opportunity for expansion in the use of steel is that typified by the San Diego water line. Here (Page 48) steel is replacing wood. The line is 36 and 40-inch steel pipe, electric arc welded, with a daily capacity of 25,000,000 gallons. . . . A new entry in the lucrative and fast-growing market for pipe is a spiral welded product which an important Ohio interest is announcing (Page 47). . . . Coiled strip from one of the company's continuous mills is fed into a forming machine at a certain angle, producing a spiral seam which is then welded. Lengths up to 40 feet can be supplied . . . Wartime needs for steel crop up in times of peace. It is estimated (Page 16) that over the next three years 100,000 tons of steel will be required for naval construction . . . In the Far East the extreme reduction in the value of silver is resulting in an exchange of this precious metal for commodities, and Belgian mills have booked (Page 98) some business on this account. . . . Bethlehem Steel is completing (Page 19) a record 230-ton steel casting.

May Certify Welds as Sales Stimulus

Wider acceptance of welding as a fabricating method is to some extent a matter of promoting confidence in the strength of welds. One authority sees (Page 44) as an urgent need the development of a service which would study and criticize the suitability of a design for fabrication by welding; inspect, test, and approve materials and workmanship; and finally certify the finished job. . . . . Uniform thickness across the full width of sheet and strip steel has long been the goal of the mill technician, and he has made progress through the improvements in design of cluster and 4-high mills (Page 33), notably the adoption of antifriction bearings for mounting roll necks and double worm gear reduction screwdowns. . . . Among the "Large Uses of Steel in Small Ways" is the manufacture of folding steel chairs, whose market is stimulated by the convention season just opened. It is estimated (Page 42) that 300 tons of steel are thus consumed annually.

Offer Ford Moratorium on Taxes

Highland Park, Detroit suburb in which Henry Ford's Model T flowered, is sufficiently convinced Ford is about to broaden his activities to offer him a 5-year moratorium on taxes provided he will reopen his Highland Park plant on a large scale (Page 66). Already there are some indications of retooling this plant; some foresee an electric refrigerator made there but majority opinion centers on a Ford 8 . . . Automotive releases for steel are slightly broader (Page 23), some parts makers have booked the best business since last June, a much more hopeful attitude is to be sensed at Detroit . . . In Detroit, as in other centers, reviving activity may not be accurately gaged by employment. Because of the stagger system a disproportionate number of men has been retained on payrolls (Page 29) and as production increases these men will be worked longer hours.

Steel Corporation 30 Years Old

Lincoln and Washington must share February birthday honors with the United States Steel Corp., which, on the basis of its incorporation, will be 30 years old next Wednesday (Page 15). Final statistics for 1930 are not yet available, but comparing 1901 with 1929, the Corporation's production of finished steel for sale has doubled, its net earnings have tripled.

Hundreds Throng Opening of Western Metal Congress

SAN FRANCISCO, Feb. 17—(*By wire*)—Hundreds of representatives of the steel and allied industries were welcomed here at the opening of the second National Western Metal congress and National Western Metal and Machinery exposition yesterday.

Early technical sessions at the St. Francis hotel and Civic auditorium were attended by over 200. J. M. Watson, 1931 president of the American Society for Steel Treating and

PRESIDENT AND AUTHOR

J. M. Watson, chief metallurgist, Hupp Motor Car Co., Detroit, and 1931 president of the American Society for Steel Treating, discussed automotive steels in a paper at the National Western Metal congress, now in progress in San Francisco

chief metallurgist, Hupp Motor Car Co., Detroit, presented a paper discussing steels for automotive use, which attracted much interest.

The congress and exposition are being sponsored by the American Society for Steel Treating and 12 cooperating technical societies. Technical sessions are being held throughout the week, morning and afternoon, while the exposition of metals and machinery, in which 62 eastern and western manufacturers are participating, is open daily from noon until 10 p. m.

Attendance at the exposition has been gratifying, according to managers, who report that 60,000 square feet of floor space in the San Francisco Civic auditorium has been leased for display purposes. Some sales of equipment already have been reported.

Societies co-operating in the event are the American Society of Mechanical Engineers, American Society for Testing Materials, American Welding society, American Institute of Mining and Metallurgical Engineers, Institute of Metals, American Chemical society, American Institute of Electrical Engineers, National Purchasing Agents association, National Association of Power Engineers, Pacific Coast Electrical association, Pacific Coast Gas association, Society of Automotive Engineers and the American Society for Steel Treating.

An interesting schedule of plant visitations has been arranged and visitors are evincing considerable interest in them as mirrors of industrial methods and activity on the West Coast.

Announcement is made of tentative plans for the third congress and exposition for the West Coast, to be held in 1933, returning to Los Angeles for the event, the scene of the first congress and exhibition in 1929.

Will Steel Output Also Reach Peak in 1970?

Population of the United States will reach its peak at 175,000,000 persons in 1970, declares Dr. William F. Ogburn, president of the American Statistical association.

Average annual production of steel ingots per capita in the United States the past five years has been 906 pounds and of pig iron 705 pounds. On this basis the country would be producing 70,781,250 gross tons of steel ingots and 55,078,125 tons of pig iron in 1970. The alltime record, set in 1929, was 54,312,279 tons of ingots and 42,270,183 tons of pig iron.

The estimate for 1970 does not take into account the average annual increase in per capita production. The average annual gain in output the past quarter century having been 2,100,000 tons, it was estimated in a radio address last September by E. L. Shaner, editor of STEEL, that continuance of this gain would give the United States an output of over 75,000,000 tons of ingots by 1940.

Steel Corporation Was Founded 30 Years Ago

Thirty years ago next Wednesday, Feb. 25, 1901, the United States Steel Corp. was founded, gathering into one general organization a number of scattered producers of steel and steel products. These included Carnegie Steel Co., Federal Steel Co., National Tube Co., Shelby Steel Tube Co., American Steel & Wire Co. of New Jersey, American Sheet & Tin Plate Co., American Bridge Co., Union Steel Co., Clairton Steel Co., Lake Superior Consolidated Iron Mines, Pittsburgh Steamship Co., Oliver Iron Mining Co., H. C. Frick Coke Co., Illinois Steel Co., Lorain Steel Co., and National Tube Co. of Ohio.

Growth of the Corporation is shown in figures in the early annual reports and those of recent years, 1929 being the latest available. For 1902 gross receipts were $560,510,479 and for 1929 they were $1,498,505,485, while net earnings of $84,779,293 in 1901 grew to $265,823,932 in 1929. Production of steel ingots in 1901 was 8,854,820 gross tons and in 1929 it was 21,868,816 gross tons,

—International Newsreel Photo

STEEL MAKES NEW YORK'S SKYLINE A JAGGED ONE AT SUNSET

By an optical illusion the Chrysler tower at the right appears higher than the Empire State building just to its left. The stacks at the extreme left are those of the New York Edison Co.

the highest of the 30 years. Total production of finished steel for sale was 8,197,232 net tons in 1902 and 15,302,669 in 1929. In 1902 the Corporation employed 168,127 workers and in 1929 224,980.

Mining Engineers Elect Officers for 1931

Robert E. Tally, vice president and general manager, United Verde Copper Co., Jerome, Ariz., was elected president of the American Institute of Mining and Metallurgical Engineers at its 140th meeting now in session at New York. Other officers elected were vice president Howard N. Eavenson, mining engineer, Pittsburgh, Pa.; second vice president, H. A. Guess, vice president and managing director, American Smelting & Refining Co., New York; and directors, Louis S. Cates, Karl Eilers, S. R. Elliott, H. G. Moulton and William Wraith.

Francis William Maclennan, general manager, Miami Copper Co., Miami, Ariz., received the William Lawrence Saunders medal given for distinguished achievement in mining. William H. Peirce, vice president, American Smelting & Refining Co., New York, received the James Douglas medal and Edmund Sharington Davenport, research engineer, United States Steel Corp., Kearny, N. J., received the Robert Woolston Hunt prize for research in cast iron, tungsten and thorium.

As in other recent years, the meeting is devoted largely to symposiums and committee meetings and early registration indicates that it will rank with the best in the institute's history. Papers on pertinent iron and steel problems are being presented before the iron and steel division of the institute and will be discussed more fully in the Feb. 26 issue of STEEL.

Speed Up Dominion Bridge

Plant of the Dominion Bridge Co. at Burnaby, B. C., is gradually returning to normal operations, according to A. S. Gentles, manager, who pointed out it will probably be three or four weeks before normal speed is reached but work is progressing.

Dominion Bridge, the manager stated, has doubled its production each year since its establishment three years and a half ago. Two plants are now in operation, one at False Creek and the other at Burnaby.

Executives List 20 Helps for Return of Business

Two thousand three hundred and four business executives, asked by the Sherman Corp., New York, to list the factors most needed to stimulate business, cited the following in the order of their importance:

Change in prohibition law, reduction of taxes, stimulation of public works, revision of sales and merchandising plans, reduction of operating costs, development of new products, amendment of antitrust laws, adjustment of the tariff, lessening of competition through trade association activity, more liberal buying, intensified management, improvement in manufacturing procedures, lowering of retail prices, shortening the hours of labor, easier commercial bank loans, lessening competition by mergers, more advertising, curtailment in production of raw commodities, lowering of wages and adjustment of gold reserves.

United States Naval Program Requires 100,000 Tons of Steel Over 3 Years

NAVAL ship construction now under way, authorized or projected by the United States indicates an outlet for more than 100,000 tons of steel in hull and equipment over the next three years. Most of this will be required within the next year, in all probability. Other craft authorized by congress before the London treaty was agreed upon have been abandoned under the provisions of that agreement.

A fleet of eight light cruisers authorized by Congress Dec. 18, 1924, has been completed or nearly completed. They are of 10,000 tons displacement each and required about 32,000 tons for hull construction and 20,000 tons for equipment. This tonnage already is supplied and offers no additional new business for steel producers.

According to A. H. Jansson, editor of *Marine Review*, Cleveland, there remain for future construction sufficient naval craft to provide considerable tonnage for steel mills. In the program laid down by congress Feb. 13, 1929, were 15 light cruisers and an airplane carrier. Six of the cruisers and the airplane carrier have been awarded, bids on one now are under consideration, three cannot be laid down before 1933, 1934 and 1935 under provisions of the London treaty, and five cannot be built at all under that treaty. Steel tonnage likely to be involved in these craft totals at least 75,000 tons.

Contract for one submarine has been let and funds are available for two more. Authorization has been given also for 12 destroyers, a transport and a submarine, for which no funds are available, but for which an appropriation may be made by Congress at any time.

Bills now are pending in both houses of congress for additional naval construction to cost a total of $82,635,000. They include an aircraft carrier, a flying deck cruiser, a cruiser and four submarines, each including armor, armament, ammunition and airplanes. While data are not available to show steel requirements for this program, in case it is authorized, it is estimated at least 30,000 tons would be called for to complete the entire group.

Steel requirements for merchant shipping were given in detail on page 15 of STEEL for Jan. 22.

Is Awarded Cruiser

The navy department has awarded the New York Shipbuilding Co., Camden, N. J., the contract for constructing the hull and machinery of light cruiser No. 37, authorized Feb. 13, 1929. Its bid of $10,450,000 was the lowest.

See Manganese Output Rise If Russian Ore Is Barred

Were Russian competition in manganese ore eliminated six large plants in the United States would resume at once and 25 smaller plants within a month, says the American Manganese Producers asociation, Washington.

Current prices of Russian manganese ore in the United States are 30 per cent below the level at which domestic production is profitable, the association declares.

Estimated initial operation of domestic plants would be about 200,000 tons a year of 50 per cent manganese ore, with possibility of increasing to 300,000 tons within a year.

The association has been active recently in seeking a customs embargo upon Russian manganese. Recently treasury department officials declared they could find no evidences of dumping.

Claims Manganese Supply Is Assured in Wartime

Minneapolis — "Our experiments have progressed to a point where it can be predicted that Minnesota deposits of manganiferous iron ore can

be made a safeguard against manganese shortage in wartime," said T. L. Joseph, superintendent, North Central station, federal bureau of mines, speaking here recently. The station, at the University of Minnesota, has been experimenting for years in the treatment of Lake Superior manganiferous ores. Some of the largest manganiferous mines were acquired in recent years by interests identified with Pickands, Mather & Co., Cleveland.

Guarantee Manganese

Washington—J. Carson Adkerson, president, American Manganese Producers association, in a letter Feb. 17 challenged the statement of Assistant Secretary of the Treasury Lowman that in case an embargo is declared on Russian manganese the steel mills will have to close. Mr. Adkerson declares domestic producers are willing under bond to guarantee delivery in the next 12 months of as much manganese as would be imported from Russia.

Secretary Lowman said in reply he was taking into consideration present domestic production, and had no knowledge of the capacity of American producers.

Bennett Hints at Still Higher Tariff on Steel

Toronto, Ont.—A deputation from Nova Scotia has interviewed Premier Bennett to ask for assistance to the iron, steel, coal and coke industries of that province. Among the requests are protection against dumping, encouragement of the use of Nova Scotia coal in coke plants, increased transport rate subventions and higher duties on steel articles.

Premier Bennett promised consideration of these proposals, stating that his government was evolving a policy that would insure the production of Canadian requirements in Canadian plants.

(Editor's note: Following rumors that the United States Steel Corp. planned to resume work on its Canadian subisdiary at Ojibway, across from Detroit, Premier Bennett and James A. Farrell, president of the Corporation, conferred in New York Feb. 2. It was believed that any Corporation development in Canada would hinge on a higher duty insuring a larger domestc market).

Structural Group Will Meet

Chicago—Structural Steel Salesmen's association of Omaha, Nebr., will hold a meeting at Hotel Fontenelle, Omaha, Feb. 26 and 27. Among the speakers will be Charles F. Abbott and Lee H. Miller, both of the American Institute of Steel Construction.

Bolt, Nut, Rivet Industry Co-operates for Employment

WASHINGTON — Careful planning by members of the Bolt, Nut and Rivet association, Pittsburgh, has kept unemployment in the industry at a minimum, according to a report by the association's president, Charles J. Graham, to the President's emergency committee. The association is continuing its work by the appointment of a central committee to co-operate with the President's organization. Mr. Graham outlines the association's work as follows:

"The bolt, nut, and rivet manufacturers have been working as a unit throughout the business depresion to lighten, so far as possible the results of decreased output which are being felt by our workers in individual plants. For the past year our business has been declining, and only recently has partial improvement begun to set in. Some of our member companies have been operating at as low as 25 per cent of normal capacity.

"To meet this situation, our association has stressed repeatedly the need for careful planning among member firms in order that as many employes as possible be carried through the employment crisis. Concerted action by these firms has shown a keen realization of responsibility to employes and to the nation.

"The principal method of stabilizing employment has been to reduce weekly or daily hours and to distribute available work among all employes. In this way we are carrying on part time probably twice as many employes than if we were operating full time with reduced forces. Although this means reduced income for all workers no case has been reported where unit wage rates have been cut. Office personnel has in general been maintained at normal strength or nearly so.

"Wherever possible, regular forces are employed on maintenance and repair jobs, painting, cleaning up, and on new construction when justified. Most of our firms have maintained employment by keeping reasonably large stocks of finished products. Our companies are trying to distribute work where it will do the most good to the greatest number, by giving preference to heads of families or by seeing that some member of each family represented on the company payroll has a steady job. In needy cases some of the firms are giving direct relief or are co-operating with some local relief agency."

The report is based on returns from 11 companies located in six eastern states. The companies so far reporting are: American Equipment Corp., Norristown, Pa.; Atlas Bolt & Screw Co., Cleveland; Automatic Screw Machine Products Co., Chicago; Bayonne Bolt Corp., Bayonne, N. J.; Brightman Mfg. Co., Columbus, O.; Clark Bros. Bolt Co., Milldale, Conn.; William H. Haskell Mfg. Co., Pawtucket, R. I.; Lamson & Sessions Co., Cleveland; Neely Nut & Bolt Co., Pittsburgh; Pawtucket Mfg. Co., Pawtucket, R. I.; Superior Screw & Bolt Mfg. Co., Cleveland.

Urges Home Repair Work

Washington—Home repair work, such as mending of gutters, mending of leaders, renewal of weatherstripping and repairing of flashing,

Almost a hole in one! Charles M. Schwab, chairman, Bethlehem Steel Co., driving off from the first tee of the Havana Country club course

which would stimulate the tinning industry and the use of sheets, are suggested by the President's emergency committee for employment as one means of local help.

Midwest Highway Work Will Employ 150,000

Chicago—About 150,000 men will be employed in highway construction and maintenance in 16 states of the Mississippi valley during the spring and summer months, it is announced here.

State highway officials of the Mississippi valley association meeting here in the Stevens hotel, have laid plans to increase 1931 road work.

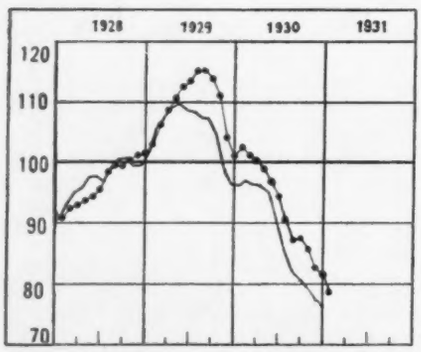
The association passed a resolution, directed to congress, asking for a modification of the federal aid regulations in order to stimulate road building in metropolitan areas.

January Employment Down

Washington—Employment in the iron and steel industry decreased 3.2 per cent in January, compared with December according to the bureau of labor statistics. An increase is noted in the agricultural implement industry. General industrial employment was down 4.2 per cent and payroll totals were 8.2 per cent lower than in December.

Metal Trades Employment Trend Downward in January

EMPLOYMENT in the National Metal Trade association continued downward through January, as shown by the chart prepared by the association, with headquarters in Chicago. The index for 26 cities for the week ending Jan. 31 was 78.4. The monthly average for 1925-1927 repre-



sents 100. The dotted line shows the index for the cities. The continuous line represents the composite for 16 representative metal trades industries, which at the close of December stood at 76.4. Shipbuilding stood at 103.1; machine tools, 87.9; iron and steel, 79.7; automobiles, 68.9; electrical machinery, 91.7; structural ironwork, 91.1; and foundries and machine shops, 77.9.

Steel Sheets Basis of New Lithograph Process

A new lithograph printing process developed in England and likely to be brought to the United States soon depends for its successful operation on the use of steel sheets. Experts say it will replace to a large extent the grained zinc and aluminum sheets, thousands of tons of which now are used in the offset printing process in this country, and that it may supersede the rotary gravure process now in use in newspaper printing plants.

The new process is a so-called dry lithograph method of printing. It is based on the fact that mercury amalgamated with copper, silver or many other metals rejects ink. Mercury amalgamates with great difficulty with iron, or not at all.

The image areas are placed on the steel sheet in the form of a thin copper plate, and the areas are then amalgamated with mercury. The steel prevents the amalgam from spreading. The steel takes the ink, while the amalgam areas reject it.

Extraordinary speed is permissible in the printing, and due to certain refinements in the method of getting the image on the plate pictures reproduced cannot be told from photographs, except by microscope, while type is reproduced as though from hand-engraved copper plate.

Name New Officers of McClintic-Marshall Corp.

George H. Blakeley, new president of McClintic-Marshall Corp., recently acquired by Bethlehem Steel Corp., announces additional McClintic-Marshall officers. Elbert A. Gibbs, formerly vice president and general manager of McClintic-Marshall Co., and Riter-Conley Co., Pittsburgh, is vice president in charge of operations; C. M. Denise, in charge of contracting and sales department since 1918, has been appointed vice president in charge of sales; and Earle J. Patterson, vice president and treasurer of McClintic-Marshall Construction Co., is vice president and treasurer of the new company.

1930 Profitable Year for Wellman Engineering Co.

Wellman Engineering Co., Cleveland, at its annual meeting Feb. 17 declared its regular quarterly dividend of 1¾ per cent on its preferred stocks, payable April 1 to stock of record March 20. The financial report as of Dec. 31, 1930, as prepared by Ernst & Ernst shows assets $4,703,488.62, compared with $4,627,968.45 the previous year. Net profit for 1930, before providing for federal taxes, was $424,868.98, compared with $328,692.63 for 1929. New business booked in 1930 was $2,521,566, compared with $3,529,891 in 1929. Unfilled orders on books Dec. 31, 1930, were $792,921, compared with $1,456,223 at the end of 1929.

Officers and directors were re-elected, as follows: Chairman, John A. Penton; president and general manager, George W. Burrell; vice president, S. R. Willock; vice president and assistant general manager, A. E. Gibson; treasurer, John A. Penton; secretary, C. C. Clayton. Directors are: John A. Penton, George W. Burrell, S. R. Willock, A. E. Gibson, Francis Seiberling, H. J. Crawford, Atlee Pomerene, John T. Webster, James Foster-Smith.

Plate Mill Is Enlarged

A 152-inch plate mill which the Bethlehem Steel Co. is moving from Coatesville, Pa., to Sparrows Point, Md., will be enlarged to 160 inches.

Decalogue of Don'ts To Hasten Business Recovery

TEN things not to do as business emerges from the depression were presented by Dr. Julius Klein, assistant secretary of commerce, in a recent address before the Manufacturers association, Bridgeport, Conn.

The ten principles are as follows, in brief:

First—Don't blame the depression for everything that has marred the economic scene since 1929.

Second—Don't compare peaks with slumps. Both are abnormalities.

Third—Don't expect the wage earner to bear the brunt of readjustment.

Fourth—Don't cut loose from associated activities in business.

Fifth—Don't ignore the amazing power of the new technology.

Sixth—Don't cut marketing research. Our gravest deficiency is in defective distribution.

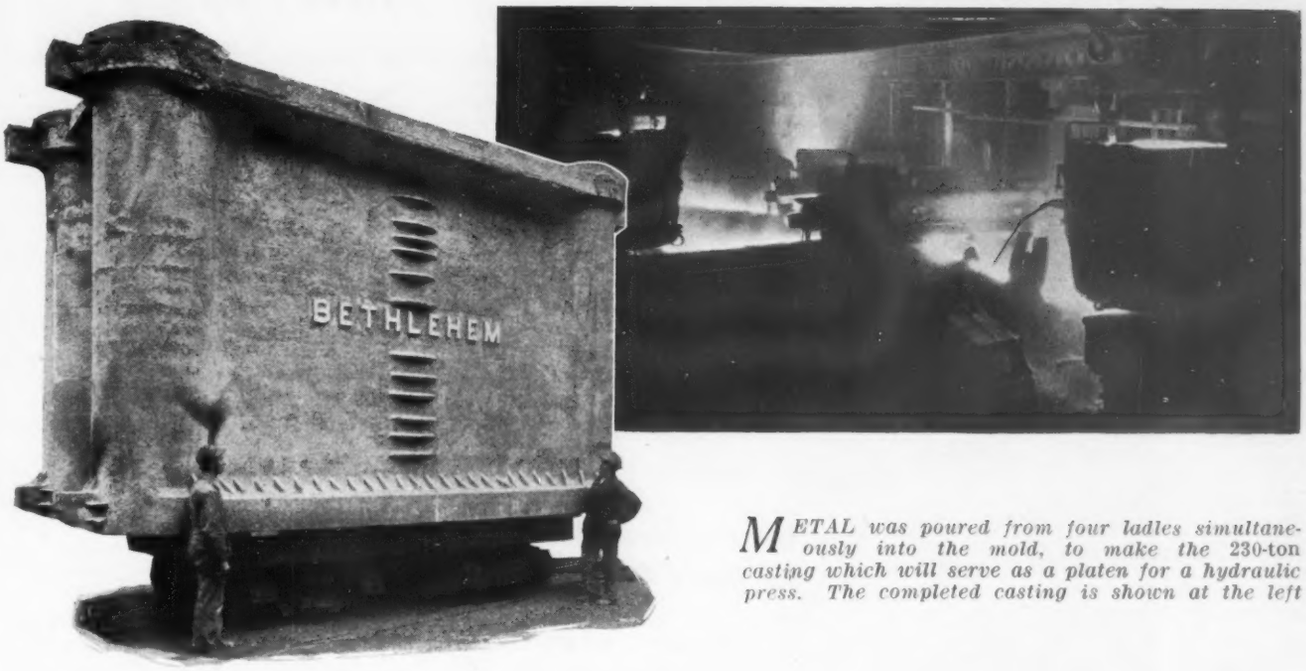
Seventh—Don't overlook the stabilizing value of foreign markets, which can not be exploited on short notice.

Eighth—Don't fall again into the delusion that the sole purpose of business is "busy-ness."

Ninth—Don't overlook the perils of obsolete equipment.

Tenth—Don't be stampeded by unfounded rumors. They are the fodder on which crises flourish.

Bethlehem Pours 230-Ton Steel Casting



METAL was poured from four ladles simultaneously into the mold, to make the 230-ton casting which will serve as a platen for a hydraulic press. The completed casting is shown at the left

WHAT is said to be the largest steel casting in the world, having a weight of 460,000 pounds, was shown Feb. 16 to technical editors and newspaper representatives at the Lehigh plant of the Bethlehem Steel Co., Bethlehem, Pa.

The casting is a platen, or cylinder jacket, for the 14,000-ton forging press of the Bethlehem plant. Up to the present such devices have been built up of separate parts, because of the technical difficulties involved in casting a single piece of this size.

The casting occupies a cubic space comparable in size to an old-fashioned drawing room, having a height of 12 feet 10 inches, a length of 23 feet 4 inches, and a width of 10 feet 2 inches.

Six open-hearth furnaces of varying capacity were used for the melting of the steel for the required metal. One problem was the difficulty in getting these six furnaces in step so as to be tapped at the proper time. Metal for the casting was poured simultaneously through four different runners, or troughs, one at each end of the mold and two at the side.

Two of the smaller furnaces were tapped into one ladle and the three other furnaces were each tapped into a separate ladle. In this way five ladles of metal were on hand during the pouring, including standby ladle.

Pouring of the casting, exclusive of the heads, was accomplished in approximately 10 minutes, and total pouring time, including the heads, required 38 minutes. The total job, however, consumed 10 weeks.

The Business Week in Washington

ON THE ground convict labor is used in the production of lumber and pulpwood in northern Russia, the treasury department Feb. 10 placed an embargo on imports of these products. The burden of proof to show that convict labor is not utilized is placed upon the importers of these products.

This decision leaves only the manganese dumping case pending. Domestic producers of manganese seek an embargo; steel producers are opposed. Recently, Assistant Secretary Lowman indicated the treasury has not found reports of dumping substantiated.

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House ways and means committee has reported favorably a bill to prohibit the importation of goods produced by convict, forced or indentured labor. The bill would bridge the difficulty of the treasury department in obtaining evidence. In spite of considerable pressure for the bill's passage, favorable action this session is not regarded as likely.

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Senator Oddie, of Nevada, is urging the enactment of laws that will embargo all imports from Soviet Russia as a means, he says, of isolating the United States "from the communist machine."

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Deadlock between the President and congress over relief measures has been broken by the passage and signing of a bill appropriating $20,000,000 for relief. Thus far congress has granted $45,000,000 for loans to farmers for purchase of seed, feed, fertilizer and fuel oil; $2,000,000 for medical supplies and rural sanitation; $20,000,000 for loans to agricultural credit corporation, livestock loan companies and similar organizations, and $2,000,000 for a revolving fund for use in southeastern states. Total of all relief measures is $69,000,000.

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The only major relief measure still pending is a bill to increase loan value of soldier bonus certificates 50 per cent, which the President and Secretary Mellon oppose and the house favors.

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Senator Norris, of Nebraska, has introduced a resolution in the upper house of congress calling upon the federal trade commission to make an investigation of the cement industry.

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Senator King of Utah has introduced a resolution calling upon the tariff commission to investigate the lead tariff. Action has not yet been taken by the senate.

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The senate has passed the Kendall bill eliminating Saturday afternoon work for postal employes and putting them on a 44-hour week. The addition of 10,000 employes would be necessitated. The bill has passed the house and is up to the President for signature.

Machine Tool Order Trend Still Down; Decline Slowed

Machine tool order index at 66.9 for January was down slightly from the 68.8 mark of December, 1930. Loss was due largely to declines in classes B and C, both considerably under December. Class A orders were somewhat higher than in December. Unfilled orders at 178.7 for January are lower than at any time in 1930, according to the National Machine Tool Builders' association, Cincinnati, though this figure is still a little better than twice the present rate of shipments. Following shows actual orders by months.

1930	*Index A	*Index B	*Index C	Total
Jan.	186.9	158.6	216.5	182.0
Feb.	156.7	201.9	202.8	170.2
March	174.8	191.7	240.0	181.2
April	171.4	199.5	200.3	179.1
May	119.5	182.5	145.6	135.1
June	121.8	132.7	162.2	125.8
July	78.4	124.4	132.9	91.1
Aug.	102.4	153.9	119.1	113.8
Sept.	129.7	138.8	215.9	135.9
Oct.	81.3	112.3	118.1	90.1
Nov.	56.0	67.8	96.6	60.4
Dec.	58.4	92.7	126.6	68.8
(Year's Average)	119.8	146.4	164.7	127.8
1931				
Jan.	64.6	75.1	68.6	66.9

*Note—Index A, base over $50,000; Index B, base $10,000 to $50,000; Index C, base less than $10,000. Base: average shipments for years 1922-23-24. Totals: The total of all reports is not an average of A, B and C, but the sum of each item in percentage of the total base.

Shipments of Locomotives Smaller in January

January shipments of railroad locomotives totaled 16, compared with 49 in December. Unfilled orders were also down. Statistics by the department of commerce follow:

	Shipments		Unfilled Orders	
1930	Domestic	Foreign	Domestic	Foreign
Jan.	48	1	579	12
Feb.	65	3	526	10
March	66	4	530	6
April	94	3	462	7
May	56	2	411	9
June	80	1	335	8
July	55	1	284	7
Aug.	73	4	229	5
Sept.	65	.....	169	5
Oct.	50	.....	127	5
Nov.	43	.....	88	5
Dec.	44	5	104	.....
(Year)	739	24	.....	.....
1931				
Jan.	16	.....	90	1

Unfilled Orders for Steel Barrels Make Large Gain

Steel barrels produced in December numbered 412,283 units, or 30.3 per cent capacity of 32 plants reporting to the department of commerce. Immediate unfilled orders are depressed, but supplementary figures not shown in the following for orders beyond 60 days, disclosed almost a 100 per cent increase from November's 698,085 barrels to Decemer's 1,248,171. Comparisons follow:

1929	Production	Shipments	Unfilled orders within 30 days
Dec.	624,365	619,058	302,052
(Year)	8,337,999	8,317,581	.....
1930			
Jan.	650,764	643,120	304,354
Feb.	604,709	599,324	313,349
March	771,686	785,951	417,933
April	769,061	766,617	322,161
May	731,087	736,147	393,843
June	651,559	638,358	319,754
July	617,420	621,091	311,630
Aug.	553,842	552,265	237,745
Sept.	564,927	565,204	253,745
Oct.	616,121	619,558	275,778
Nov.	497,539	500,409	230,960
Dec.	412,283	406,327	188,902
(Year)	7,440,998	7,434,371	.....

Shipments of Enameled Ware Lag at Year's Close

Shipments of enameled sheet metal ware in December totaled 250,568 dozens, third lowest of the year. The December aggregate compares with 263,365 dozens of November, according to report of approximately 80 per cent of the industry to the department of commerce in the following:

In Dozens

1929	Total	White	Grey and Colored
Dec.	391,523	103,404	288,119
(Year)	4,504,102	1,861,011	2,653,091
1930			
Jan.	332,146	110,758	221,388
Feb.	331,915	120,523	211,392
March	341,372	124,856	216,516
April	318,431	124,562	193,869
May	290,617	114,709	175,908
June	247,861	90,151	157,710
July	213,420	70,718	142,702
Aug.	309,645	89,259	220,386
Sept.	297,622	97,262	200,360
Oct.	329,337	107,553	221,784
Nov.	263,365	79,719	183,646
Dec.	250,568	70,554	180,014
(Year)	3,526,299	1,200,624	2,325,675

Plans Ceramic Congress

The thirty-third annual meeting of the American Ceramic society which is sponsoring the American Ceramic congress with co-operation of the American Refractories institute, Canadian National Clay Products association, Feldspar Grinders institute, Grinding Wheel Manufacturers association and the National Brick Manufacturers association, will be held in tho Cleveland Public auditorium, Cleveland, Feb. 22 to 27. Social and business functions of the associations and divisions will be held at their respective hotels and all technical sessions in the auditorium. The ceramic exposition will be open each afternoon and evening.

Financial News of Steel Industry

CRUCIBLE STEEL CO. OF AMERICA, Pittsburgh, earned net of $4,045,122, equal to $4.59 a common share, in 1930. Dividend disbursements for 1930 were $4,499,346. In 1929 company had net of $8,162,344, or $11.66 a share.

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Transue & Williams Steel Forging Corp., Alliance, O., had net loss of $99,158 for 1930 against net profit of $325,844 in 1929.

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Interlake Iron Corp., Chicago, reports net profit of $2,066,083, equal to $1.03 a share in 1930; in 1929 net was $2,002,639, or $2.63 a share.

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McKeesport Tin Plate Co., McKeesport, Pa., had net profit of $2,003,058, or $8.34 a share in 1930, as compared with $2,038,315, or $8 a share in 1929.

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Michigan Steel Tube Products Co., Detroit, reports net of $41,377 in 1930, equivalent to 41 cents a share. This compares with $345,212, or $3.45 a share, in 1929.

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J. D. Adams Mfg. Co., Indianapolis, reports net earnings of $900,242, equal to $3, a share, for 1930. In comparison company earned $4.32 a share in 1929.

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General American Tank Car Corp., Chicago reports net of $6,518,181 equal to $8.03 a share, in 1930. In 1929 earnings were $5,770,741, or $7.56 a share.

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International Nickel Co., New York, has placed common stock on a 60-cent annual basis, against $1 previously paid, by declaring quarterly dividend of 15 cents a share.

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Arthur G. McKee & Co., Cleveland, earned $547,747 net in 1930, equivalent to $6.49 a share on class B stock, compared with $446,740, or $5.29 a share in 1929. Ratio of current assets to liabilities is 8 to 1, compared with 2.55 to 1, one year before. In 1930 there was a gain of $248,168 in capital surplus over 1929.

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M. A. Hanna Co., Cleveland, earned $2,226,814 net in 1930, against $3,646,322 in 1929 and $2,425,430 in 1928. Balance sheet shows current assets of $6,404,339 and current liabilities of $2,311,436, a reduction in funded debt of $350,000 and an increase in surplus of $1,281,291, which raises that figure to $19,070,404.

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Foote-Burt Co., Cleveland, earned $26,515 net in 1930, equal to 27

(*Concluded on Page* 73)

Industrial Men in the Day's News

J. Roy Tanner, President, General Manager, Pittsburgh Valve, Foundry & Construction Co.

EXCEPT for a period between April, 1928, and January, 1931, he has been identified with the one company since 1901.

AFTER working in engineering and water departments of Allegheny, he started as construction engineer, rising through various promotions to the vice presidency in 1916.

ACTIVE in engineering societies, he has served on committees and also the American Standards association.

ELECTED president and general manager of Pittsburgh Valve, Foundry & Construction Co., Pittsburgh, as noted in STEEL of Jan. 29, J. Roy Tanner belongs to that group of industrial leaders who have climbed every rung of the industrial ladder. In assuming his new post he becomes the head of one of the leading and oldest organizations engaged in valve production and power piping engineering and construction work, its constituent companies tracing their origin as far back as 1866. Mr. Tanner became associated with the present company as a construction engineer in 1901, one year after its incorporation.

Pittsburgh has been the scene of Mr. Tanner's entire industrial career. Born there in 1876, he received his public and high school education in that city and prepared for his future work with an engineering course at the Western University of Pennsylvania, now the University of Pittsburgh. His first employment was with the bureau of engineering of the city of Allegheny, now a part of Pittsburgh. Three years later he became identified with the water department as a civil and mechanical engineer and shortly after, in 1901, joined the Pittsburgh Valve, Foundry & Construction Co.

Mr. Tanner's early position with that company later was followed by his promotion to the post of chief draftsman, then to chief engineer in 1905 and subsequently, in 1911, he was made general manager, and in 1916 the duties of the vice presidency were added. Severing his connection with the company in April, 1928, he engaged in sales and consulting engineering work for himself for three years and in January, 1931, he returned as president and general manager.

Mr. Tanner has been actively associated with engineering societies, being a member of the American Society of Mechanical Engineers and the American Society for Testing Materials and having served as chairman of several committees of the former organization and the American Standards association. His club memberships include Duquesne, Oakmont Country and Keystone Athletic clubs and Pittsburgh Athletic association. Golf as well as other outdoor sports are his favorite forms of recreation.

TELL SCHIRNDING BERNA, from 1927 to Feb. 1 sales manager of Union Twist Drill Co., Athol, Mass., was appointed general sales manager of National Acme Co., Cleveland, effective Feb. 15. Mr. Berna was born at Pelham Manor, N. Y., July 24, 1891, and was graduated as a mechanical engineer from Cornell university. Between 1912 and 1915 he was employed as engineer by Cutler-Hammer Mfg. Co., Milwaukee, and after a brief period in 1915 as sales engineer for that company at New York he became district sales engineer at Cincinnati the same year. He served in that capacity until 1919 and then was appointed sales manager of the G. A. Gray Co., Cincinnati, leaving in 1927 to go with Union Twist Drill Co., as sales manager from which postion he resigned Feb. 1.

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Carleton B. Beckwith has been appointed advertising manager, New Departure Mfg. Co., Bristol, Conn., in succession to Charles F. Olin, deceased.

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Millard Romaine, manager of the engineering service department, Cincinnati Milling Machine Co., Cincinnati, spoke on "Recent Milling Machine Applications" before the Feb. 16 meeting at Detroit of the machine shop division of the American Society of Mechanical Engineers.

Hans Ernst, research engineer, Cincinnati Milling Machine Co., also spoke at the same meeting on "Hydraulic Applications in Machine Tools."

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R. M. Chester has been appointed general sales manager of Neely Nut & Bolt Co., Pittsburgh.

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C. H. Murray, director of personal service, American Rolling Mill Co., Middletown, O., has been appointed a member of the National Industrial Conference board's advisory committee on industrial relations. He succeeds Charles R. Hook, president

of the American company, in this position.

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W. M. Levett resigned recently as vice president and general manager of Welker-Hoops Mfg. Co., Middletown, Conn., and also as president of Continental Casting Co., a subsidiary.

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Dave Jones, George Jones, J. P. Busher, J. I. Callahan, M. J. Bernet, F. E. Davis and C. J. Boldt were recently elected directors of Geometric Stamping Co., Cleveland.

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Willis L. King, senior vice president of Jones & Laughlin Steel Corp., Pittsburgh, and for nearly 62 years associated with that company, celebrated his eightieth birthday Feb. 15.

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J. I. Andrews, vice president and general manager of sales, American Sheet & Tin Plate Co., Pittsburgh, is leaving Feb. 21 for a five-week trip to California.

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William L. Batt, president of S K F Industries Inc., New York, has been appointed a director of the recently-created research foundation at Purdue university, Lafayette, Ind.

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J. G. Ordway and E. P. Mork have been elected additional vice presidents of Crane Co., Chicago. All other retiring officers have been re-elected.

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Frederick W. Mierke, for the past two years turbine engineer with the General Electric Co., Schenectady, N. Y., is now with the engineering department of Beloit Iron Works, Beloit, Wis.

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Joseph V. Kiley, of T. J. Kiley & Son, Boston, was elected president of the Boston chapter of the Institute of Scrap Iron and Steel Inc., at the annual meeting, Feb. 5. He succeeds George B. Doane.

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Edgar A. Rogers, formerly Philadelphia manager of Ford, Bacon & Davis Inc., New York, engineer, has been placed in charge of the firm's recently-established office in the Union Trust building, Cleveland.

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Sterling W. Hubbard, for many years Cleveland resident manager of Rogers, Brown & Co., Cincinnati, now Rogers, Brown & Crocker Bros. Inc., pig iron merchant, has been appointed manager of the Cincinnati office of Otis & Co., Cleveland.

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William S. Brashear has been elected president and general manager of Barnard & Lease Mfg. Co., Moline, Ill., builder of milling machinery, to succeed A. R. Wiegel. He has been with the company for 22 years and since 1915 has served as sales manager.

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W. W. Weaver, formerly identified with Republic Steel Corp., Youngstown, O., has been appointed superintendent of the rolling mill department, Indiana Harbor works, East Chicago, Ind., for Youngstown Sheet & Tube Co., Youngstown.

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Albert Troll, formerly vice president of Belmont Stamping & Enameling Co., New Philadelphia, O., has been elected chairman of the board. W. Judkins, formerly general manager and secretary-treasurer, has been elected president and treasurer. John T. Troll is the new vice president, and Fred F. Hall, secretary.

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L. W. Stevens, superintendent of Veeder-Root Inc., Hartford, Conn., manufacturer of die castings, recorders, indicators, etc., has been appointed general manager of both Hartford and Bristol, Conn., plants.

H. L. Spaunburg, factory manager at Bristol, has been named chief engineer. All engineering activities will be consolidated at Hartford.

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Carl L. Spangenberg, owner of an interest in Central Screw Co., Coldwater, Mich., has also been appointed general manager of the Titus Iron Foundry Co., Coldwater.

D. L. Prouty, of Dearborn, Mich., formerly with General Electric Co., Schenectady, N. Y., has been appointed office manager of the Titus company.

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H. C. Beaver, formerly executive vice president of Rolls Royce Co. of America, New York, has been elected a vice president of Worthington Pump & Machinery Corp., Harrison, N. J., to devote his attention primarily to the administration of the sales department.

Elber E. Yake has been promoted to vice president in charge of manufacturing and engineering.

R. L. Richwood has been made general superintendent of the Cincinnati plant, Worthington Pump & Machinery Corp.

A. V. Saharoff was made works engineer at Cincinnati, and J. C. Russell, production manager. Michael Riesner was promoted so that he will be able to concentrate more fully on design and development of new and improved products.

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Frank J. Lanahan, president, Fort Pitt Malleable Iron Co., McKees Rocks, Pa., and R. J. Teetor, general manager, Cadillac Malleable Iron Co., Cadillac, Mich., have been appointed additional members of the American Foundrymen's association malleable division advisory committee.

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Ralph E. Blazo, seller of pig iron, coke and ferroalloys for many years, has been appointed manager of the coke department of O. Jackson Meyer Inc., 1447 Broad street station building, Philadelphia. Mr. Blazo for some years was associated with Rogers, Brown & Co. in Boston and Philadelphia, later became secretary of Reed, Fears & Miller, and of recent years has been with Hickman, Williams & Co. Inc., Philadelphia.

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C. C. Clarke has been appointed superintendent of the recently-organized spiral welded pipe department, American Rolling Mill Co., Middletown, O. This department will also make other factory products.

R. C. Beam has been named manager of the spiral welded pipe selling department, established as a separate department of the sales division. H. M. Ives will assist him. Mr. Beam has closely followed the development of the company's spiral welded pipe during the past year.

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Wade M. Brison, recently superintendent of the roll shop, International Nickel Co., Huntington, W. Va., and previously with United Engineering & Foundry Co., Pittsburgh, has rejoined the latter company as a member of the roll and steel castings sales department. For many years Mr. Brison was at the Lincoln works of the United company, where he served successively as draftsman, assistant designer and assistant superintendent of the roll shop.

John C. Griffin has been appointed eastern sales representative for United Engineering & Foundry Co. For two years he has sold rolling

—Photo by Blank & Stoller Inc.

H. A. Lomax

Who as noted in STEEL of Feb. 12 was elected vice president and manager of roll sales for the Wheeling Mold & Foundry and Duquesne Steel Foundry divisions, Continental Roll & Steel Foundry Co., Pittsburgh

mill equipment for Hubbard Steel Foundry Co., and previously was manager of sheet and tin mills for Bethlehem Steel Co., Sparrows Point, Md. He also served as manager of La Belle and Laughlin works of American Sheet & Tin Plate Co., and at one time was manager of tin mills for Weirton Steel Co.

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James A. Fairfield has been made manager of grinding wheel sales for the New York Belting & Packing Co., New York. He formerly was sales manager, Marschke division, Black & Decker Mfg. Co., Towson, Md.

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A. B. Wray, formerly sales manager of the industrial division, Morse Chain Co., Ithaca, N. Y., and Detroit, has been named chief engineer of the same division.

W. W. Bertram, formerly manager of the New York office of the company, has been appointed sales manager of the industrial division to succeed Mr. Wray.

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R. Home Smith, who as noted in STEEL of Feb. 12 was elected chairman of Algoma Steel Corp., a subsidiary of Lake Superior Corp., Sault Ste. Marie, Ont., is a prominent financier of Toronto, Ont., identified with many Canadian industrial corporations. He is president of Algoma Central & Hudson Bay railway, Algoma Central Terminals Ltd., Consolidated Toronto Lands Corp., Caladon Shale Brick Co., and is largely interested in mining enterprises, being president of the Vipond, Consolidated, Keeley Siver Mine, the Huronian Mining & Finance Co., and the McKinley Mines Securities Co. Mr. Smith is a director of English Electric Co. of Canada, Lake Superior Corp., Howey Gold Mines Ltd., and acts as receiver for Mexico North Western railway.

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Augustus Wood, from 1915 to 1920 chief enginneer and works manager of Niles Tool Works, Hamilton, O., has returned to that organization as consulting engineer. During the past ten years he has held positions as works manager of Putnam Machine Co., Fitchburg, Mass., and consulting engineer for the parent company, Manning, Maxwell & Moore Inc., New York. More recently he has been serving as consulting engineer with Consolidated Machine Tool Corp., Rochester, N. Y. After graduating from Cornell university, Mr. Wood became affiliated with Bement-Miles Co., Philadelphia, where under the training of the late Frederick B. Miles he rose to be chief engineer. When the Bement company became a subsidiary of Niles-Bement-Pond Co., he was transferred to Niles Tool Works Co., Hamilton, where he became associated with the late George T. Reiss and where he became chief engineer and works manager in 1915.

Obituaries

EDWIN O. MARTING, 52, formerly of Cleveland, who for the past five years has been president of Witherbee, Sherman & Co., Port Henry, N. Y., died Feb. 15 at a sanitarium at Clifton Springs, N. Y. He was born in Berea, O., and was graduated from Baldwin-Wallace college. He became connected with the Marting Iron & Steel Co., Ironton, O., as a clerk and by successive promotions worked his way to the vice presidency. Early in 1917 he had the duties of the general manager added to those of vice president when Col. H. A. Marting, chairman of the board and president relinquished them, because of ill health. He next became president but resigned five years ago to take over the management of the Witherbee, Sherman & Co. properties at the request of officials of the National City bank of New York. He was in charge of blast furnaces and ore mines.

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Arthur T. Doud, works manager of Reed Air Filter Co., Louisville, Ky., died recently.

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J. B. Prest, president, Prest Machine Works, Oklahoma City, Okla., died recently.

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L. M. Hackett, general plant superintendent, American Tank & Equipment Corp., Oklahoma City, Okla., died recently.

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J. M. Armstrong, 66, president, Quad Stove Mfg. Co., Columbus, O., died recently. He had been associated with the company for 20 years.

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John T. Cullen, 72, president of the Cullen Co., Clinton, Iowa, manufacturer of boilers, tanks, etc., died recently in Davenport, Iowa, as a result of an automobile acident.

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Ralph M. Fried, 66, treasurer of Western Iron Stores Co., Milwaukee, seller of machine tools, mechanics' tools, shop and mill supplies, etc., died Feb. 10.

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Eugene A. Grindle, 66, for 21 years general superintendent of the malleable iron department, International Harvester Co.'s Deering works, Chicago, died recently. He retired in May, 1930, on account of ill health.

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Dr. John Lundie, 74, consulting engineer, inventor of numerous railroad devices and president of Lundie Engineering Corp., New York, died there Feb. 9. Born in Scotland, he was graduated from the University of Edinburgh. When he located in this country he engaged in railroad engineering in Oregon and Washington and then in municipal work in Chicago. His inventions included a combined electric hoist and traveler, the telfer system, a tie plate, a rheostat and a duplex rail anchor.

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Joseph Lodge, 83, president, Lodge Mfg. Co., South Pittsburg, Tenn., died there Jan. 4. He was born in eastern Pennsylvania and organized his company 15 years ago.

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Harry M. Wallis Sr., 70, formerly president of J. I. Case Plow Works and Wallis Tractor Co., Racine, Wis., now the Racine division of Massey-Harris Co., Toronto, Ont., died Feb. 6. He retired five years ago.

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Henry Butler Utley, 76, who when he retired last year was vice president and director of International Harvester Co., Chicago, died Feb. 11 at Beverly Hills, Calif.

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Gustave Trasenster, president of the Usines a Tubes de la Meuse, Societe Belge de l'Azote, and Societe Commerciale de Belgique, died recently. He also was vice president of the Hadir, the Luxemburg iron and steel corporation, and of the Hauts-Fourneux de la Chiers.

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John H. Masters, sales manager of Washington Iron Works, Wilmington, O., since August, 1930, died recently. He was graduated from the University of Illinois and became mechanical engineer for the V. & K. Co., Dayton, O. Later he was mechanical engineer for Washington Metal Products Co., Washington Court House, O. He then became identified with Washington Iron Works.

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Col. Frank M. Dorsey, 52, general manager of Metal Production Co., Cleveland, which he organized in 1924, died recently at Lyndhurst, O. Before the war he was employed by National Lamp Co., Cleveland, and after the armistice he became manager of the experimental engineering department of that company. During the war he developed a new gas for the chemical warfare service division, in which he was given the rank of colonel.

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Sir Charles A. Parsons, 76, chairman, C. A. Parsons & Co. Ltd., Newcastle-on-Tyne, England, manufacturer of steam turbines, dynamos, searchlight reflectors and other electrical apparatus, and chairman also of Parsons Marine Steam Turbine Co. Ltd., Newcastle, died Feb. 12 while on a West Indian cruise. He was the in-

ventor, among other things, of the reaction type of steam turbine as applied to marine use.

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Donald Ross, 57, president of Eidlitz & Ross, New York, steel erectors, died Feb. 11, as a result of a fall from an apartment under construction.

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Charles F. Lear, local and district representative at Cleveland for Darwin & Milner Inc., American division of Darwins Ltd., Sheffield, England, manufacturer of high grade tool steels, hacksaws, etc., died Feb. 6.

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Calvin H. Wilson, 49, for 13 years secretary of Insley Mfg. Co., Indianapolis, iron and steel fabricator, died recently. Born in Williamsburg, Ill., he lived in Indianapolis for 33 years, having been identified with Marmon Motor Car Co., prior to going with Insley Mfg. Co.

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James G. Patten, president since 1925 of Metals Protection Corp., Indianapolis, died recently. Locating in Kokomo, Ind., in 1909, he became manager and secretary of Globe Stove & Range Co. He aided Elwood Haynes in organizing the Haynes Stellite Co., of which he later became secretary. He next founded the Udylite Process Co., of which he was president when he sold out to General Motors Corp.

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Frederick C. Brunke, whose death was briefly noted in STEEL of Feb. 12, was associated with United States Steel Corp. and its subsidiaries for more than 38 years. Born in Rochester, N. Y., Sept. 23, 1876, he early removed to Buffalo, where he attended high school. He then entered the Buffalo office of Carnegie Steel Co. Sept. 13, 1892, rising by successive promotions from messenger to salesman. In 1911, when the United States Steel Products Co. established its Toronto, Ont., office, he was appointed manager in charge of western Ontario territory, where he continued until he retired Jan. 1, 1931.

□ □ □

Sir Arthur Dorman, head of Dorman, Long & Co., London, England, bridge building and construction firm, died Feb. 12 at his Yorkshire home. He entered the iron trade as apprentice in 1866 with Richardson, Johnson & Co., South Stockton, England. In 1876 he and Albert de Lande founded Dorman, Long & Co., which acquired the West Marsh and Brittania Iron Works and began to manufacture rolled joists and other sections first from iron and then from open-hearth steel. Later sheet and wire mills were added as were bridge building and construction departments. In 1899 they merged with Bell Bros. to produce open-hearth steel, and a large steel plant was erected at Redcar. Since 1915 several other companies have been absorbed.

Here and There in Industry

OTIS STEEL CO., Cleveland, has placed a contract with the General Electric Co., Schenectady, N. Y., for electrical equipment required in connection with its new continuous strip mill. The order is valued at about $600,000. Mechanical equipment of the new mill is already under way and operation is planned for next fall.

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Titanium Alloy Co., Niagara Falls, N. Y., will remove its pigment department to St. Louis, Mo., March 1, continuing alloy production in Niagara Falls. Andrew Thompson is vice president and general manager of the company.

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Allis-Chalmers Mfg. Co., Milwaukee, has opened a branch at Sioux Falls, S. D., for the sale and service of track-type and industrial wheel tractors. Karl H. Schweider is manager. He formerly was assistant sales manager, supervising agricultural sales in the Northwest, from the main office at Milwaukee.

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Affiliated Engineering Cos. Ltd., Montreal, Que., will remove its offices from the Southam building to suite 1606 University tower, 660 St. Catherine street west, effective March 1. Several new accounts have been added recently. The company handles lines of a number of British and American makers of steam plant, industrial and aeronautical equipment.

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Browning Arms Co., Ogden, Utah, manufacturer of firearms, has removed its general offices and headquarters to St. Louis, where it has leased office and warehouse space at 1132 Spruce street. The company has discontinued selling through jobbers and will sell direct to the consumer. A small manufacturing department will be maintained in St. Louis. J. E. Russell is general manager. The main manufacturing plant is in Liege, Belgium.

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Geometric Tool Co., New Haven, Conn., has appointed J. H. Ryder Machinery Co., Terminal Warehouse building, Toronto, Ont., agent for sale and service of its tools in the province of Ontario. The company is headed by J. H. Ryder, who has been engaged in machine tool distribution in Canada for many years. E. W. Mertz will assist as direct factory representative in the eastern counties and the Detroit office will assist in Essex, Kent and Lambton counties.

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Aug. Kloenne, Dortmund, Germany, has taken an order through its French licensees for a Kloenne waterless gas holder of 3,500,000 cubic feet capacity for the city of Paris. This is the fifth such holder placed in France recently.

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J. A. Werme Steel & Iron Co., Oklahoma City, Okla., has established a steel derrick division which will have charge of the fabrication and erection of oil field derricks. R. Ebner, formerly with Slater Steel Derrick Corp., Sand Springs, Okla., has been placed in charge of the new division.

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Pittsburgh Metal Airplane Co., Pittsburgh, subsidiary of Pittsburgh Aviation Industries Corp., has been purchased by the General Aviation Corp., subsidiary of General Motors Corp. H. J. Thaden, general manager of the Metal Airplane company, will continue in that capacity.

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Claud S. Gordon Steel X-Ray Laboratory, Western avenue and Fifteenth place, Chicago, has been equipped for testing steel, iron and metal up to 4½ inches in thickness. The service is made available to all industrial producers or users of steel and other metals. Pieces of any size can be handled with the equipment now installed. The city office of the company is at 708 West Madison street, Chicago. A branch has been established at 1988 East Sixty-sixth street, Cleveland.

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Adams Foundry, Rome, N. Y., in continuous operation since 1835, has been incorporated as the Adams Foundry Inc., with the following officers: President, Elizabeth Adams; vice president, Preston H. Porcheron; treasurer, Louis J. Schneible; secretary, Edith Adams Sprenger. The board of directors includes these officers and James Henry Schneible. Edith Adams Sprenger, who has been actively connected with the management of the foundry for many years, was appointed manager. Charles Beth, superintendent of the Rome Locomotive Works for 22 years, is now superintendent of the Adams Foundry Inc. Throughout its long career

(*Concluded on Page* 64)

MIRRORS of MOTORDOM

DETROIT

ACCUMULATING evidence of an upward trend in automobile production this spring is manifesting itself. Output still is below normal and highly concentrated in the low-price field, but a few makers—Olds, Chrysler and Oakland-Pontiac, to mention the more prominent—have run on expanded schedules the past fortnight.

These augment the market's chief support thus far in 1931—Chevrolet—which continues steady. Ford has increased slightly over the past week. These two are now almost on an identical weekly basis.

These manifestations of gaining activity are partly in anticipation of the usual spring buying, and reflect the gain February invariably shows over January.

Production of the automobile industry in the first week of February ran to almost 51,000 units compared with 45,000 the last week of January. February will be at least a 200,000-unit month, compared with 186,000 in January, and at that with fewest working days for any month of the year.

Detroit Finds Business Best Since June, 1930

The recent upward flurry in the stock market has put Detroit in a better frame of mind, and to back it up, material orders from the motor plants are better, with a unanimity of opinion right now that business is the best since last June.

Parts makers' releases are being strengthened and orders from allied autmotive industries are in some cases 50 per cent better than a short week or two ago.

Chevrolet continues at 3000 cars per day and following an output of 70,000 cars for January will make approximately 68,000 cars in February. The preliminary schedule for March is now placed at 70,000 units.

Chevrolet has just released material on the basis of 55,000 cars, covering requirements for the latter part of February and running into the opening weeks of March. Employment continues high at each of its plants and two main assembly wheel lines are now running.

Ford Production Creeping Up on Nearest Competitor

Ford has been creeping up on his chief competitor, though it is doubtful he will make the 75,000 cars he planned for February. Ford's weekly production appears now to be about 14,000 cars, some departments working 4 days a week, which is a gain of about 1000 units a week from two weeks ago.

Ford has just issued more liberal release instructions to material suppliers, giving the latter more time, for the immediate future at least, in which to ship supplies.

For March, Ford is expected to make 100,000 cars, according to present tentative schedule.

The recent Ford dealer discount revision has particular significance. Instead of a sliding scale from 17 to 22 per cent, all dealers now, large or small, benefit under one percentage, 22 per cent discount.

This means Ford is apparently doing something new in taking over from his distributors part of the financial responsibility, or he may be countering the Chevrolet sales success thus far in 1931, Chevrolet allowing distributors 24 per cent off.

Considered in the light of the used car problem, the increased Ford commission means a greater ability to cope with trade-ins, possibly larger allowances, all calculated to sell more new Model A's.

Chrysler hopes to make 15,000 cars this month and has taken a big jump in production schedules, mostly in the Chrysler and Dodge lines. Plymouth assembled 1500 cars last week, double the approximate 750 of the week previous. DeSoto is reported at 300 daily, 5 days; a week ago DeSoto was down.

Oakland-Pontiac division of General Motors made some 2600 cars last week, more than a 30 per cent jump from a bare 2000 the week before.

Olds goes ahead in leaps and bounds. Two weeks ago this division made 175 models daily, 6 days. Last week it stepped up to 275 a day, cut working days to 5 for the week, and this week is making 300 a day.

Buick continues practically static at virtually half capacity with 500 models, 4 days, coming from the lines. This will in all probability be increased, for an approximate 8000 cars are outlined for February's total.

Willys-Overland has also been receiving an impetus. At 450 units, 4 days, it made 1800 cars this week against 1500 last.

All Schedules Stepped to Higher Production Rates

Studebaker, having produced and shipped 4200 models in January, outlined 5200 for February and so far is producing accordingly.

Hupp has shown a slight gain, too, from 300 last week, to 500 this week.

Auburn and Cord have ambitious programs and now that Cord claims 25 units daily, Auburn will move manufacture of some of its convertible models from Connersville to Auburn, Ind.

The rest hold unchanged. Hudson-Essex is working 3 days, one more than when last reported and continues steady at some 400 daily, or 1200 units combined for both Hudson and Essex, for the week.

Marmon makes 50 a day, 5 days,

(*Concluded on Page* 66)

EDITORIAL

How Scrap Sellers Can Co-operate To Build Market

WITH evidence that the tonnage of scrap consumed in the manufacture of iron and steel in the United States is approximately 40 per cent of the amount of iron ore used, scrap dealers anticipate larger markets and view themselves as real competitors of iron ore producers. Since publication in the Jan. 1 issue of STEEL of definite data on the relationship of scrap and ore consumption to iron and steel production many scrap dealers have been delving into prices of iron ore delivered at various points, and comparing scrap prices with those of ore. They are more interested than ever before in how iron ore prices are determined according to metallic contents, and the system of guarantees; in a word, they are studying the iron ore industry.

While it is perfectly safe to say that as the total blast furnace capacity of the country increases the use of scrap in the manufacture of pig iron naturally will increase in volume, it is open to question whether the ratio of scrap to iron and steel will continue to increase as it has in the past ten or fifteen years. There also remains the question as to whether the scrap merchant in competing with ore will be able to give the definite guarantees as to the contents of his material, as the mine operator gives in selling his product.

Metallurgical and Economic Factors in Consumption of Scrap

The amount of scrap that can be used in pig iron manufacture depends on many factors, some of them metallurgical and others economic. Naturally, among the latter the price is important, and it is true that in such times as the industry is experiencing today there is a tendency on the part of furnace operators to do everything possible to reduce his costs. If the price of scrap is such as to fit in the plan, more of it is going to be used.

There is a point, however, beyond which it is not economical for the furnace operator to use scrap in place of ore, and this is largely dependent on the cost of the additional fuel required. Here again price enters into the problem, and on these two counts alone there is a possibility for considerable play, the use of scrap varying upward or downward, depending on how these factors affect the final cost. It is to be noted in the article in STEEL, previously referred to, the ratio of ore to iron and steel increased slightly in the heavy-production year, 1929. Iron ore is cheap, the price varies little from year to year, and in a period of heavy demand for iron and steel, when prices of scrap are relatively high, more ore is used.

In addition to these economic factors there is the matter of metallurgy, and it is the belief of makers and consumers of pig iron that the use of scrap in place of ore beyond certain limits affects the quality of the iron. No modern furnace operator will make poor iron if he can avoid it, because too much good iron is produced to let him prosper under such circumstances.

Increasing Output of Steel Alloys Makes Analysis More Important

The other metallurgical factor is the growing use of alloy steels of many descriptions, and the character of the scrap available to the furnace and steel man. To what extent the scrap from these alloys is going to be usable is a question, but it seems certain that there are elements used in the manufacture of many of the alloy steels that are undesirable, if not actually detrimental, in blast furnace practice, both from the standpoint of furnace operation, and from the content of the iron produced.

Therefore, there will be a definite tendency on the part of the furnace operator to question scrap more carefully than ever before so that he will not use material which he is convinced by experience is detrimental. It is understood that the scrap industry is studying this question of analysis, and if it eventually works out a system whereby guarantees can be given, with prices based on guarantees, the furnace operator will be in a better position to judge the comparative values of iron ore and scrap. The ore producer, who generally is an ore consumer, views scrap as a valuable help in conserving his ore reserves; more power to the scrap dealer, if he can sell scrap according to analysis and guarantee.

A preliminary survey tends to show that improved furnace practice has offset the slight decrease in the average amount of metallic iron in Lake Superior iron ore in the past twenty years. The exhibit makes all the more impressive the progressive increase in the proportionate use of scrap, showing that improved furnace practice also has conserved ore.

The Eleventh Commandment

If the Leaders of an Industry Cannot Put a Stop To Cut-Throat Competition and Price Cutting, Then the Government May Be Forced To Take a Hand

BY CHARLES F. ABBOTT
Executive Director, American Institute of Steel Construction

IF MOSES had given us eleven commandments instead of ten, the eleventh might well have been "Uphold the Sales Price." Short of downright dishonesty, there is nothing so unethical in business as cutting the price for the sake of getting an order.

Nothing is so easy as to cut prices; and nothing is so hard as to get them back when once they have been pulled down. Any child can break an egg by throwing it on the floor, but all the learned scientists in the world cannot pick it up again. Any fool can cut prices, but it requires the combined power of the industry to put them back again.

There is only one way to make money in business. That way is to sell the product at a profit. The fact that there are many in every line who are making a profit proves that knowledge and self restraint are not without their rewards.

It takes courage to look a large order square in the face and say "No" if it is not in accord with established terms and prices. Nevertheless, there are concerns in highly competitive industries that are displaying that courage year in and year out. True, they may not have the big volume, but they have not been drowned in red ink.

Of course, you cannot get all orders without price being the inducement in some cases, but there are many other factors worth talking about. When the price is once submitted there should be no further concessions. That is salesmanship.

The whole structure of business is based upon profit and not upon the mere production or exchange of commodities. Business success demands exactness. The world is filled with men who guess, or assume, or are led to understand, that a certain figure is nearly, or approximately, or to all intents, accurate. But they are bossed by the man who knows.

There are many concerns without adequate cost systems and there are others who supplant their cost figures with a system of outguessing competition in computing their selling prices. A disregard of cost figures will eventually invite bankruptcy.

Business men can solve this problem to their own satisfaction and to their own financial success if they know accurately their costs and refuse to be bluffed into a sale at a price which will not cover those costs plus a fair profit.

If demoralized price cutting is to be eliminated and the business transacted on a basis of profit, the manufacturer must exert his leadership, and in the formulation of his selling policy, he must define fair practices and then vigorously enforce them without any partiality or deviation. One of the most constructive influences is the establishment of a one price policy, thereby establishing prices and discounts that will be fair to all.

It is not the lawful reduction of prices that I condemn. We must recognize the ethical distinction between necessary price reductions and price cutting which is inspired by a selfish desire to obtain more than a reasonable proportion of business.

Prices that are reduced to dispose of excess inventories or to meet emergency conditions, confronting a producer would not, and should not, be classified as illegal price cutting.

On the other hand, prices that are cut for the purpose of taking business away from others who may be entitled to it, is an objectionable form of price cutting. Under the spirit of the Clayton act such practices, I firmly believe, are illegal. Cut prices to obtain more than one's share of business or to obtain business on a price basis alone is another form of price cutting that is reprehensible. To submit one price, only to return and submit three or

From an address presented at the opening session of the Annual Conference of Iron, Steel and Allied Industries of California, at Del Monte, Cal., Feb. 12, 1931.

four additional and lower prices, thereby starting a price cutting orgy, represents a vicious form of price cutting.

The Clayton act plainly condemns price discriminations which are designed for the purpose of lessening competition. The idea behind the federal law is in line with what we all believe in, and I feel confident that we could cure the evils of price cutting today were we not likely to lose our way in the morass of legal technicality that so often follows when we depend entirely upon the courts to correct economic evils.

Reforms are difficult to realize when left to the compulsion of law and administration. Reform must exist in the hearts of men before it is really accomplished. Therefore no statute will ever cure business men of the evils of price cutting until business men cure themselves individually of all desire to indulge in evil practices. We must convince ourselves of the desirability of the right before we can attain it.

The anti-trust laws, with some of their now obsolete interpretations and many doubtful regulations under them, are probably responsible for some of the business man's worries. A modification of these laws with intelligent interpretations would undoubtedly offer relief; but by no means are they alone responsible for the new conditions now confronting our business activities, nor would their repeal remove the principal present day problems.

The argument for such a revision is valid in itself for the anti-trust laws were enacted to prevent restraint of trade rather than to forbid all trade agreements. Therefore, trade agreements which have for their purpose the conservation of a product for the best interest of the public or the saving of an industry would not necessarily come under the prohibition of the intent of the framers of the statutes. It is becoming more and more apparent that production in important fields has outgrown many of the rulings under the anti-trust laws.

While modifications are undoubtedly necessary, it is well to remember that extreme selfishness on the part of some at a disregard of the rights of others represents a principal evil. Until individual selfishness can give way to justice and fairness with the spirit of the industry of paramount importance, we cannot expect any relief even though the laws might be modified. It is only through honest co-operation that enlightened selfishness can possibly dissipate ignorant competition which is the real hazard.

The cause of price cutting is to be found in the mental qualities of the cutter. Ignorance, misunderstandings, confusion, greed, distrust and antagonism are the destructive elements. The solution of the problem involves the curing or elimination of these qualities. Failure to do so means continued unprofitable operation.

Our only legal cure of the evil is education. By hammering indisputable facts home again and again to every member of an industry the influences that promote price cutting can be reversed.

Education should start by destroying the illusion that greater profits can be obtained from an increase in volume secured by price cutting. When this illusion has been destroyed the root of the price cutting evil will be eliminated.

We can do much to effect this education through co-operation, through coming together and honestly discussing our problems. Around a conference table, in trade association meetings, this education is possible and without circumscribing the rights of individuals.

If the executive heads of each company within an industry cannot put a stop to cut-throat competition and price cutting, then the government may be forced to do so. Labor unions, in a number of instances, have already taken the matter in hand.

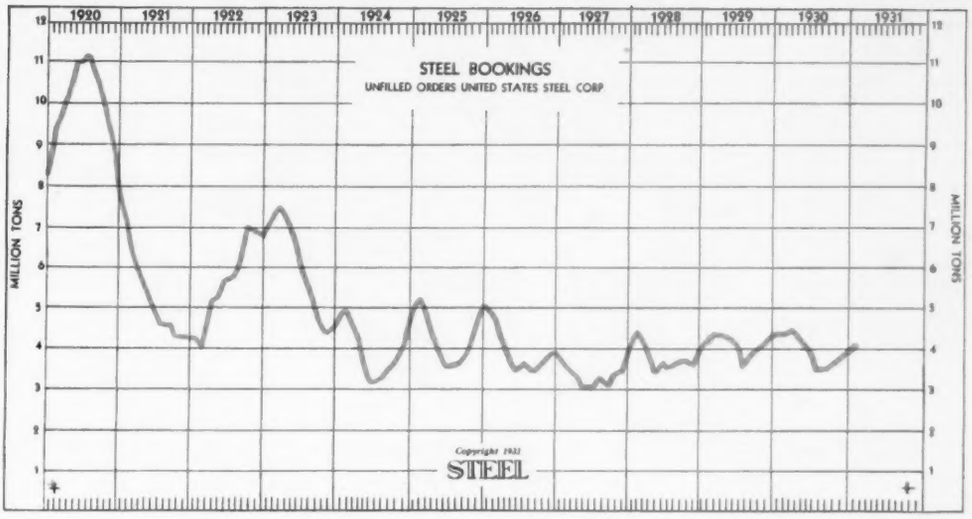
Those who insist upon price cutting and destructive competition as a means of obtaining their business can well afford to stop and consider just what may be in store for them. Labor supported by public opinion will insist upon profitable operation of our industries. If the present management cannot succeed then it must step aside for another method of control.

The challenge to industry today is whether we are going to meet this issue and solve it effectively, or whether we are going to invite the government to do it for us. You have witnessed what happened in Italy. Extreme individualism in industry and trade has been replaced by a state dictator. Russia is doing the same, only through a different political method.

The people of the United States have declared for a democracy and American industry is confronted with the serious necessity of providing that these economic emergencies can be successfully coped with under a democracy, that these business problems can be solved through co-operative effort and without recourse to governmental interference. This is certainly a time when we should all be willing to submerge our wilful desires, our selfish ambitions for the betterment of our industries and traders and thus prove our ability to co-operate for progress.

We have this challenge thrown at us by Mussolini and by Stalin. Are we going to acknowledge that our democratic principles are wrong? I think not, for we have learned how to co-operate.

THE BUSINESS TREND



Thousand Tons	
1930	
Jan.	4,469
1929	
Dec.	4,417
Nov.	4,125
Oct.	4,086
Sept.	3,902

Thousand Tons	
1931	
Jan.	4,132
1930	
Dec.	3,943
Nov.	3,639
Oct.	3,482
Sept.	3,424

Steady Improvement in Business Continues

INDUSTRY is making a strong fight for recovery. Each week it manages to hold its past gains and to acquire slight new advantages. This slow, steady improvement is gradually dispelling doubt and fear, and if it continues for several months, business sentiment will become charged with a spirit of confidence which has not been in evidence for a long time.

The slight improvement in industrial activity cannot be traced to important developments in the major industries. On the contrary, it seems to be the result of numerous minor factors. For instance, the moderate increase in the output of automobiles is not due to a pronounced revival of buying. And in turn, the steel industry's return to the 50 per cent mark in steelworks operation was accomplished without marked increases in the consumption of steel by the principal consumers.

Employment Not a Reliable Index of Industrial Activity

In some quarters, actual gains in industrial activity are discounted because corresponding gains in employment have not been apparent. This seeming discrepancy will increase rather than decrease, and for that reason it is important that the true situation be understood.

In many branches of industry, employers have tried to hold as many men as possible, regardless of the fact that the work available for them had shrunk to almost nothing. Companies which have accomplished this—by the stagger system and by other means—can increase their operations to perhaps 60 or 70 per cent of capacity without taking on additional employes. For this reason employment will not be a true index of industrial activity until conditions are well on the road to normal.

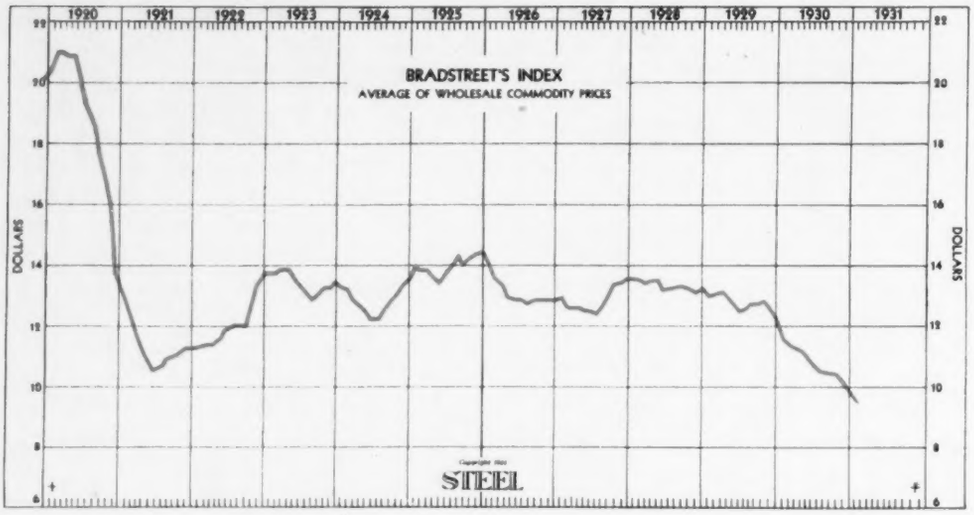
The upturn in steel operations, in freight car loadings, in automobile output and in numerous other activities falls short of normal seasonal gains. Compared to corresponding improvement in January and February of 1930, the current record appears disappointing, but today the significance of industrial operations lies in the trend and not in the volume. The steady upward climb is more reassuring at this time than was the encouraging volume of the same period in 1930.

Price Trend Dips Slightly; Outlook Uncertain

Prices still are sagging. Bradstreet's index of wholesale commodity prices stood at $9.31 as of Feb. 1, as against $9.51 on Jan. 1 and $9.84 on Dec. 1. STEEL's composite of 14 steel and iron prices remained a second week at $31.69 and appears to be destined to remain near that level for several weeks.

Some of the statistical records for January fail to reflect the cheerful picture afforded by the pig iron and steel production figures. Orders for machine tools, for instance, showed a decline in the three-month moving average to 65.3, the lowest point for the index in recent years.

The order backlog of the United States Steel Corp. gained a little more in January than had been expected, and reached 4,132,351 tons, the best total since last April.



	1931	1930
Feb. 1	$9.31	$11.51
Jan. 1	9.51	11.68

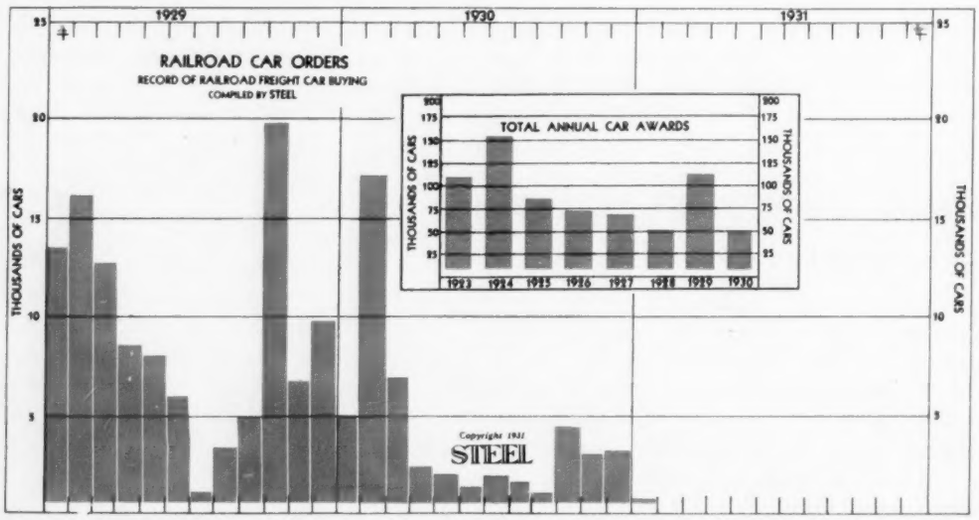
	1930	1929
Dec. 1	9.84	12.23
Nov. 1	10.06	12.40
Oct. 1	10.30	13.70

Commodity Prices Continue Downward for Sixteenth Month

On Feb. 1 Bradstreet's index of wholesale commodity prices was $9.31. For the sixteenth consecutive period the price trend has been markedly downward against little or no resistance from any of the commodity groups involved. One year ago the index stood at $11.51, the decline since that time amounting to 19.2 per cent. Although the price index is at the lowest point since Jan. 1, 1915, it still is 6.8 per cent above the figure for August, 1914, which often is pointed to as a basis for comparison. Following the sharp price readjustment of 1920-1921 the indicator reached its highest point on December 1, 1925. The decline from this most recent peak has been 35 per cent.

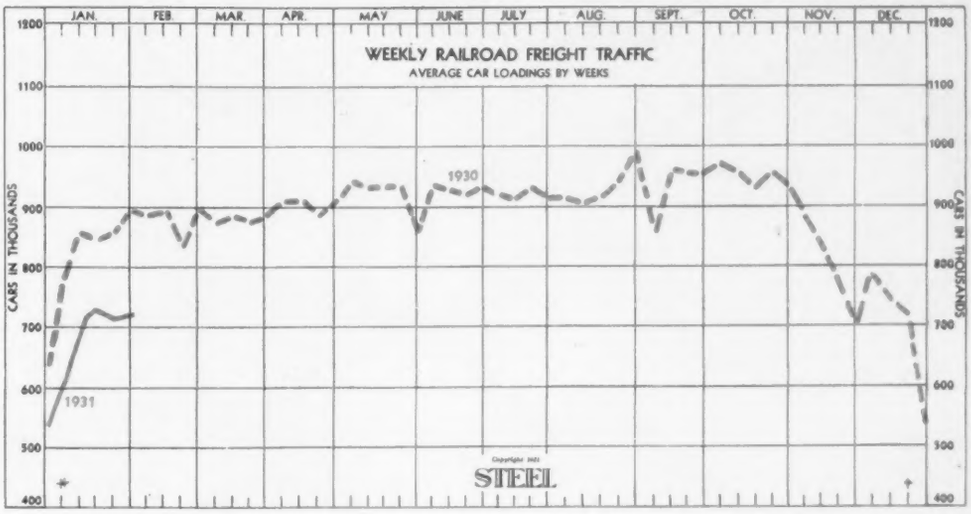
January Freight Car Buying Drops to Lowest Level in Years

Orders for only 100 freight cars were awarded by American railroads in January. This extremely slack activity in car buying is not surprising in view of the sharp shrinkage in the volume of freight traffic in 1930 and in the present year to date, the disappointing level of railroad earnings, and the abundance of railroad rolling stock in good repair. The past month was the lowest in freight car awards since February, 1919, when a period of inactivity set in following a record-breaking 1918. Two years ago, at the start of a comparatively good car year, January orders were for 13,196 cars. A year ago 5072 freight cars were ordered.



	1931	1930
January	100	5,072

	1930	1929
December	2,729	9,710
November	2,621	6,361
October	4,116	19,506
September	576	4,517
August	1,111	2,854
July	1,389	341


WEEKLY RAILROAD FREIGHT TRAFFIC
AVERAGE CAR LOADINGS BY WEEKS
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
1200 1100 1000 900 800 700 600 500 400
CARS IN THOUSANDS
1930
1931
STEEL

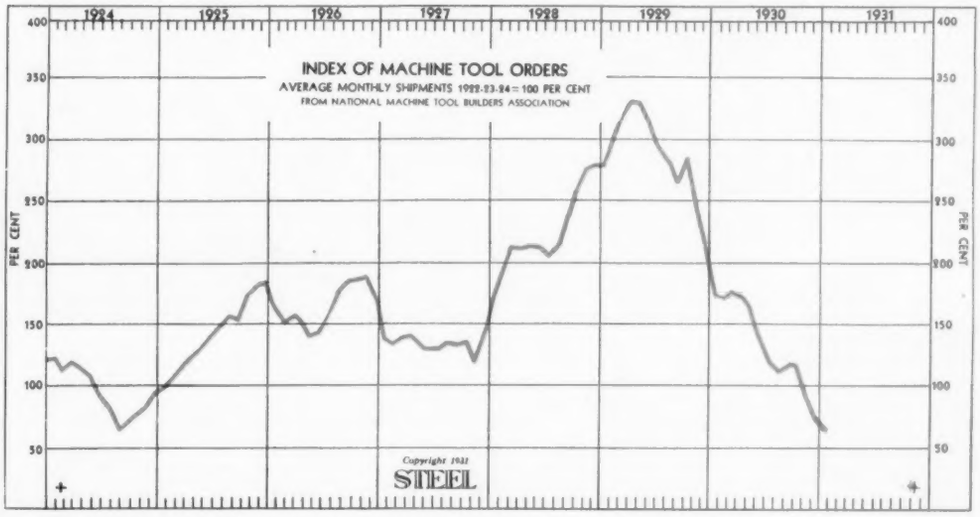
	1931	1930
Jan. 31	719,281	898,835
Jan. 24	715,690	862,346
Jan. 17	725,938	847,155
Jan. 10	714,251	862,461
Jan. 3	615,382	775,745

Revenue Freight Car Loadings Fluctuate in Undecided Course

Revenue freight car loadings for the last three weeks in January shifted slightly in a narrow range a little above 700,000 cars. From 714,251 cars loaded in the week ended Jan. 10 there was a small gain to 725,938 cars during the next week, and then for Jan. 24 a recession to 715,690 cars. During the last week reported there was a very slight gain which brought loadings to 719,281 cars. The figures which show the decrease from the activity of last year, however, have witnessed a marked increase. In the week of Jan. 17, loadings were 121,217 cars under the same week of last year, a week later they were 146,656 cars under the corresponding period of 1930, and in the last week were 179,554 cars below last year's level.

Orders for Machine Tools Decline in January

The three months moving average of machine tool orders in January lost nearly eight points and descended to another new low at 65.3. The individual record for last month also was down, after a slight recovery in December's individual record, which incidentally had not been enough to slow up the downward course of the moving average. Previously the lowest point of the index in recent years was at 69.4, in August, 1924. Except when the average held almost even last October, the trend in orders has been steadily downward since last March, at which time the index was 177.8. During the past month the larger firms made better headway than the smaller, reversing the December situation.


1924 1925 1926 1927 1928 1929 1930 1931
INDEX OF MACHINE TOOL ORDERS
AVERAGE MONTHLY SHIPMENTS 1922-23-24=100 PER CENT
FROM NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
400 350 300 250 200 150 100 50
PER CENT
STEEL

	1931	1930
January	65.3	175.4
	1930	1929
December	73.1	222.1
November	95.5	247.2
October	113.3	287.0

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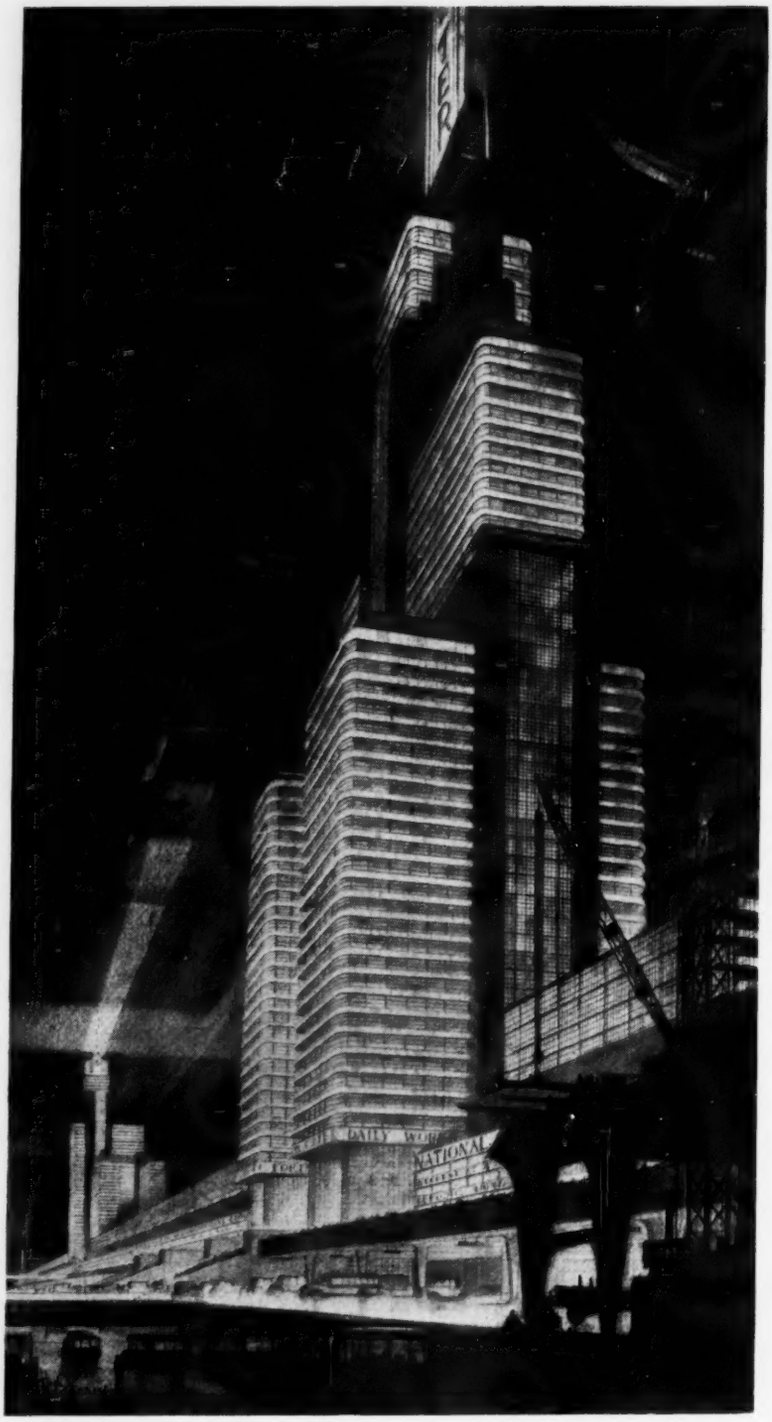

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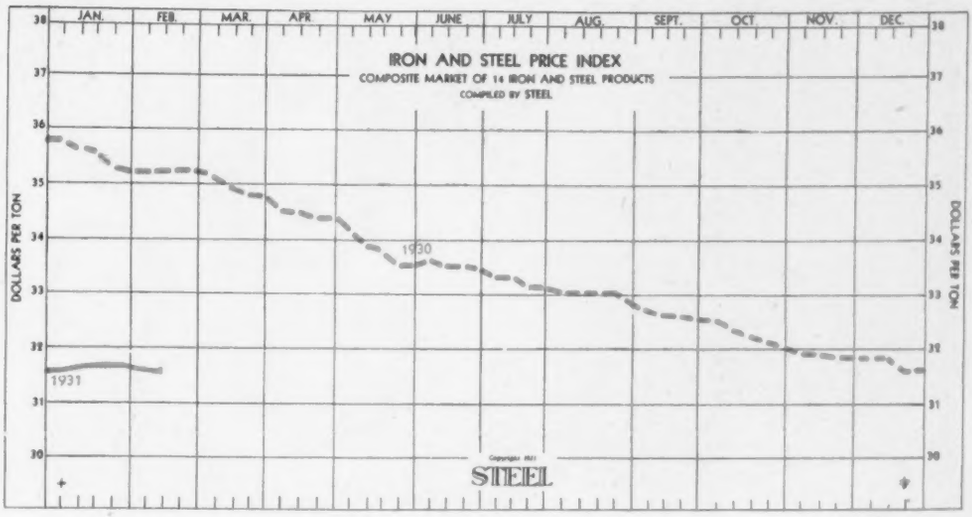
Weekly Figures

Feb. 11	$31.69
Feb. 4	31.69
Jan. 28	31.73
Jan. 21	31.73
Jan. 14	31.73
Jan. 7	31.66
Dec. 31, 1930	31.66
Dec. 24	31.66

Monthly Averages

January	$31.71
December	31.74
November	31.92
October	32.26

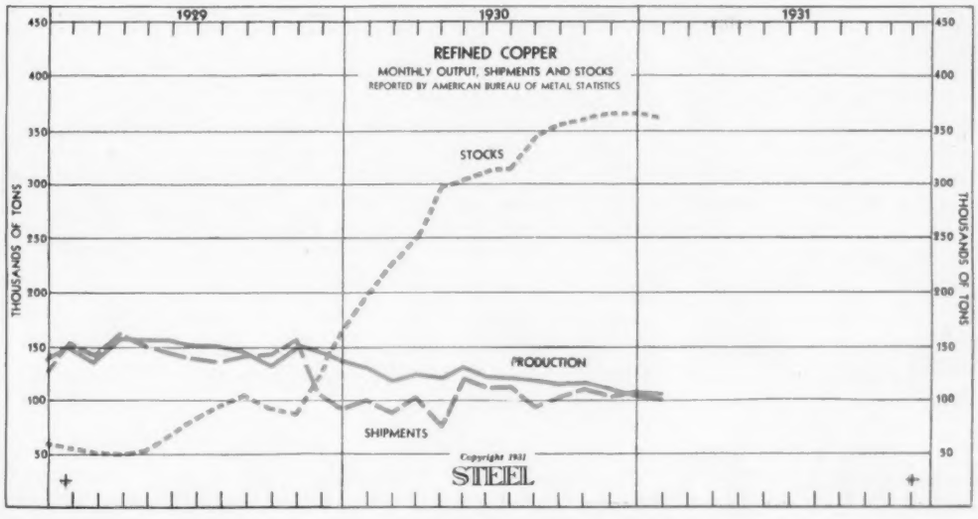


Iron and Steel Price Composite Remains Unchanged at $31.69

Remaining unchanged at $31.69 for Feb. 11, the price composite which covers 14 iron and steel products shows little evidence of major price trends. Only minor changes have prevailed since the beginning of the year. The lowest point reached recently was $31.66, established Dec. 24. This figure held for three weeks, until mid-January brought a rise of seven cents. The rise held for a third week, until a readjustment in southern pig iron took off a slight edge. Thus it is that by the middle of the second month the index has not gone as low as its position at the beginning of the year, a sign of stability which was little in evidence during the long downward trend of 1930, particularly in the latter half.

Refined Copper Stocks Decrease Again as Production is Cut

Further moderate reduction in stocks of refined copper in January was accompanied by declines in production and shipments. On Jan. 31 there were 363,827 tons in stock, as compared with 367,175 tons a month previously and 203,404 tons a year previously. Output of 102,458 tons, at the lowest point in several years, was considerably under the January, 1930, rate of 132,374 tons, and still further below the output of two years ago, 154,472 tons. Shipments dropped from 109,023 to 105,806 tons. At the same time, export shipments increased to 45,597 tons as compared with 39,169 tons in December. Curtailment of output in the third successive month was accompanied by a second successive cut in stocks.



Stocks

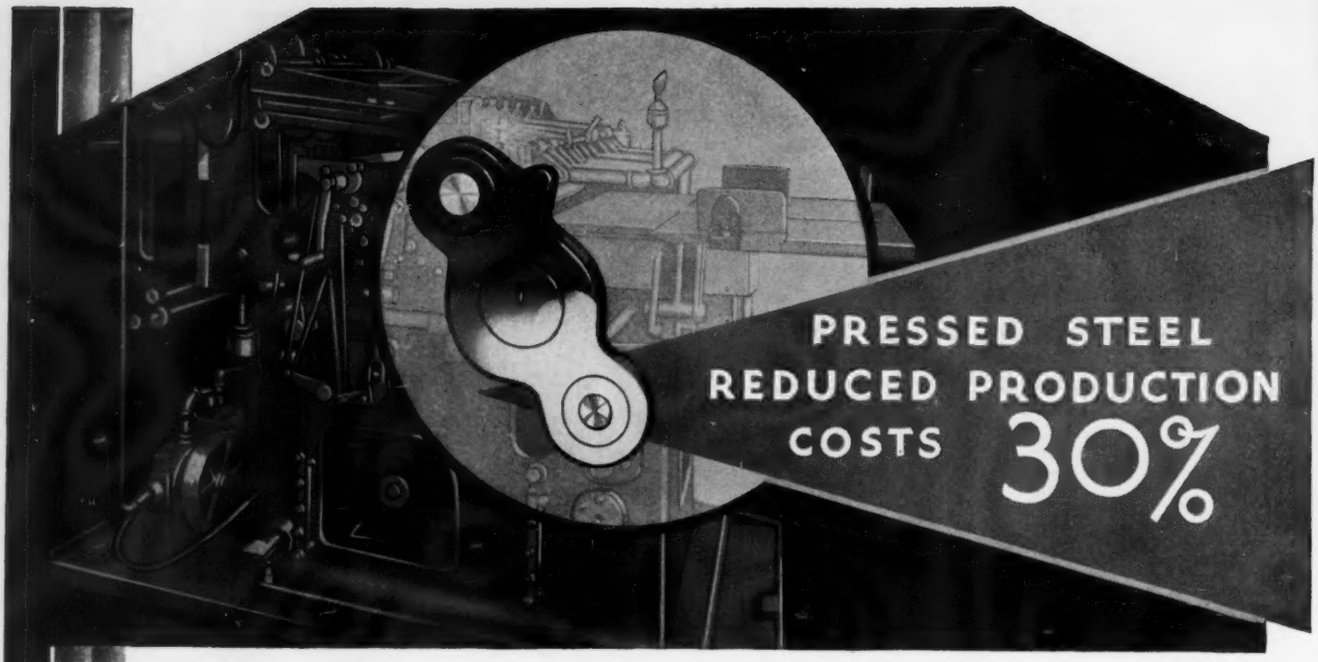
January, 1931	363,827
December, 1930	367,175
January, 1930	203,404

Production

January, 1931	102,458
December, 1930	106,366
January, 1930	132,374

Shipments

January, 1931	105,806
December, 1930	109,023
January, 1930	100 290



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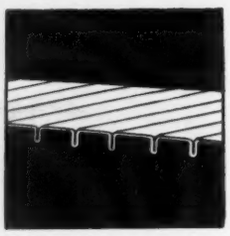

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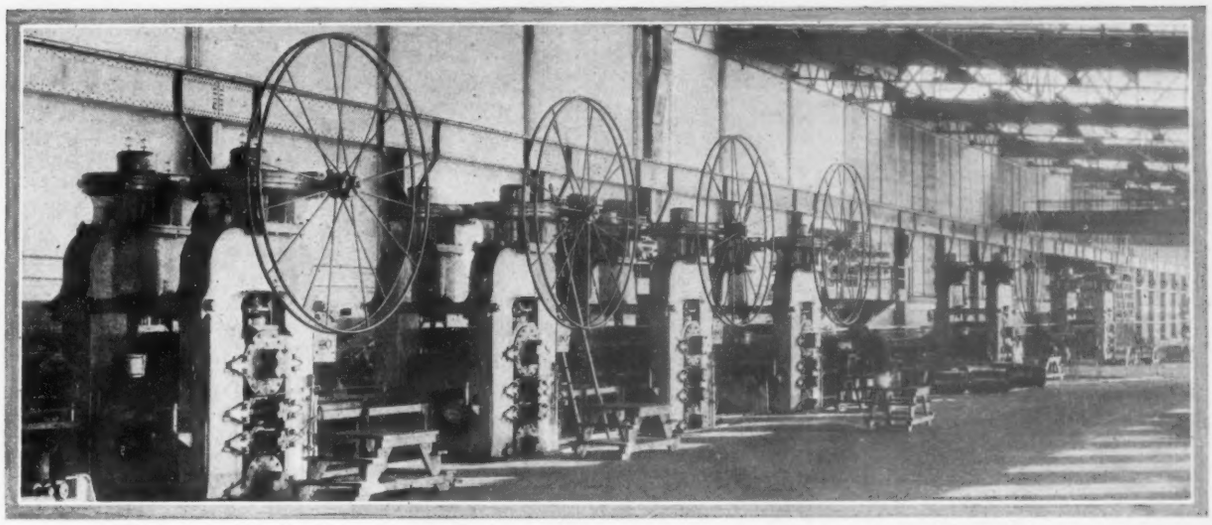


Group of 4-high mills arranged in tandem for the cold reduction of wide strip steel

Antifriction Bearings Aid Progress of Backed-Up Mills

BY M. D. BAUGHMAN
E. W. Bliss Co., Salem, O.

ADVANTAGES to be gained by using work rolls of small diameter have been known for a century or longer. Mann, in his patent dated 1865, states, "In the rolling of metals, especially in the formation of sheet metal and hoop iron, rolls of small diameter are advantageous, turning out much better work than rolls of large diameter." When small diameter work rolls are used on material of any considerable width it is necessary to "back-up" or support them by larger diameter rolls to keep them from springing, and also to provide larger roll necks on which to mount bearings of sufficient size to carry the load. The two principal types of backed-up mills developed along these lines were the cluster mill and 4-high mill, and since 1865 various patents have been granted covering improvements on these units.

For many years the backed-up mills for hot rolling were confined to the 3-high or Lauth type, a 4-high slabbing mill of the Carnegie Steel Co., and a 4-high plate mill of the Lukens Steel Co. For cold rolling the early preference turned to the cluster mill and a number were built and operated. This preference, perhaps, was accidental, since the 4-high mill would do the work equally well, although there were some particular advantages in the cluster mill design.

While these types of mills were well known among engineers, their general adoption was retarded by conditions then existing in the industry, mainly the lack of knowledge on the part of operators as to the advantage to be gained and the fact that trade demands were being filled adequately by the existing equipment.

The greatest development of backed-up mills began with the construction of a large cluster mill for the International Nickel Co. Inc., Huntington, W. Va., for cold rolling 36-inch wide sheets of nickel and monel metal. Various steel manufacturers conducted tests on this mill, rolling steel sheets with such satisfactory results that plans were immediately started for the construction of rolling mills of the backed-up design for wide sheet and strip production.

The cluster mill of the International Nickel Co. was built by the E. W. Bliss Co., Brooklyn, N. Y. and was described in the Apr. 15, 1926 issue of *Iron Trade Review,* predecessor of STEEL. This mill was installed in 1924 and originally was equipped with babbitted bearings. About a year later a duplicate mill was installed in the same plant. These mills operated successfully in cold rolling wide sheets, true to gage, for a period of five years with babbitted bearings. Only during the past year have these mills been changed over to roller

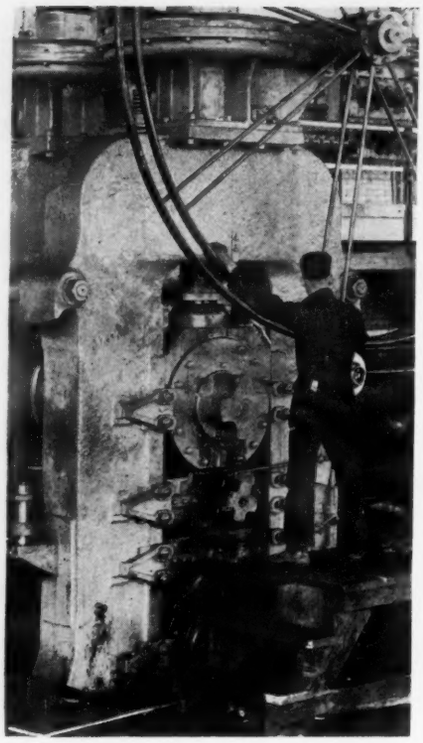
bearings on the backing roll necks. This was done merely to save power and maintenance expense.

The application of antifriction roller bearings to roll necks and other parts of rolling mills has been a great aid in the development of the modern mill. The credit for developing bearings for this purpose largely is deserved by the Timken Roller Bearing Co. which started the application by equipping its mills at Canton, O., with specially-designed tapered roller bearings. Since then a large amount of research work has resulted in the development of bearings of capacity suitable to any application. The great advantage of roller bearings is the saving effected in power and maintenance expense. Since a large saving in power was afforded by applying roller bearings to backing roll necks, it was only logical that these bearings should be applied to all other parts of the mill, thus effecting even greater savings. In this development the E. W. Bliss Co. played an important part, being the first to apply roller bearings on the necks of the work rolls of a 4-high mill.

Difficulties Were Encountered

Like all other new developments the application of roller bearings was not without its difficulties. Even after the large amount of work required to properly design and test the bearings themselves, there still remained some problems to solve regarding their proper mounting on a rolling mill. Experience has shown that failure of these bearings generally has been due to improper mounting, overloading beyond the capacities stated, or improper lubrication. The last two causes should and can be corrected easily by proper attention.

Statements have been made that wide sheets could only be rolled true to gage on mills equipped with roller bearings because the friction heat generated in plain bearings was sufficient to distort the roll. The record of the cluster mills of the International Nickel Co. over a period of five years entirely disproves such statements. The primary reason for installing roller bearings was not to prevent distortion, but to save power, as previously mentioned. The matter of distortion is secondary. Distortion arises from different causes, in all mills, but if the rolls are ground properly to compensate for this deformity the sheets will be rolled true to gage on a mill with either plain or roller bearings.



Backed-up mill for cold rolling strip showing method employed for mounting the roll necks in roller bearings

Distortion is caused by heat generated by friction at the roll necks, the rolling friction between the work roll and backing roll, and the rolling friction of the work roll against the material being reduced. In addition there is the distortion or springing of the roll caused by pressure being applied against the material through the screwdowns.

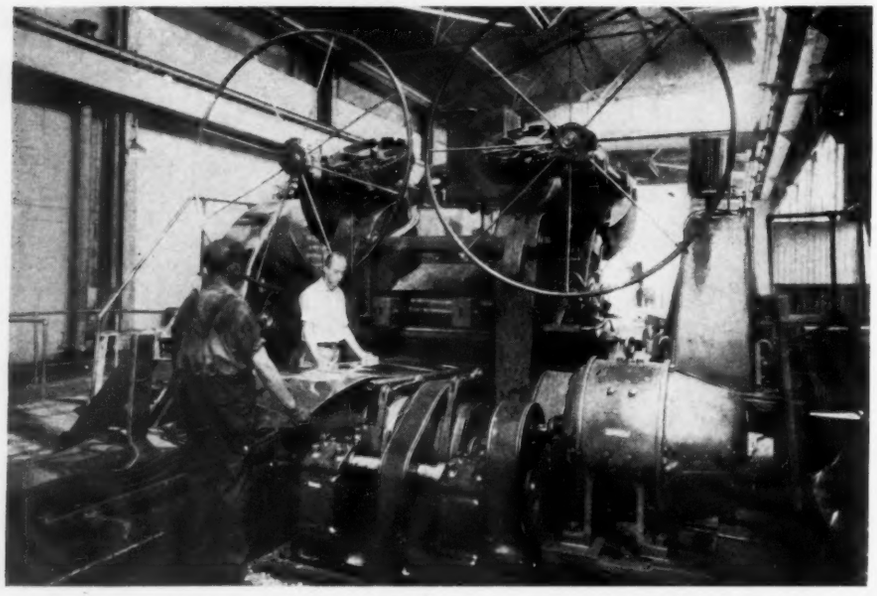
When babbitted or plain bearings are used, considerable heat is generated on the roll necks which, in turn, is transmitted to the roll ends, causing them to expand. When the ends of the backing rolls expand, the amount of crown on the work roll is reduced. When roller bearings are used, little heat is generated on the roll necks, and consequently the roll ends do not expand and reduce the amount of crown on the work roll. In either case the center of the roll expands because of the heat generated by rolling friction. Expansion in the center of the roll increases the amount of crown on the work roll. When a plain bearing mill is started in initial operation the roll necks are cool and the roll ends do not expand, but after a few hours of operation friction heat begins to build up in the roll ends.

Must Control Expansion

Thus, the necessity of controlling the expansion of the rolls while they are in operation is evident and by the control of this expansion and the crowning of the rolls, the mill can be regulated so as to roll flat stock true to gage. The expansion of the rolls can be controlled either by the application of heat or a cooling medium. For example, a mill with plain bearings should be warmed up at the start with a hotter flame on the ends of the rolls than in the middle. However, as the mill operates the heating of the roll ends should be reduced to compensate for the friction heat of the bearings which will begin to build up, and, more heat applied in the middle as required to keep the face of the work roll straight.

The crowning of the rolls depends on the amount of reduction taken, the width of face of the roll, material and characteristics of the roll, heat affecting the roll from several sources, wear of the roll face, and other factors having to do with the particular material being reduced. Hence, it is easily understood that the changing of the amount of friction heat on the roll necks is only one item affecting the rolling of flat stock true to gage.

Another modern improvement made on recent mills is the double worm gear reduction screwdown, entirely enclosed in oil and dustproof cases. Each screwdown is independently and individually driven by a small motor, equipped with a magnetic brake and an inching control which operates the motor 1 revolution, which is equiv-



Delivery side of cluster-type mill designed to roll sheets 36 inches wide

alent to 0.0005-inch travel of the screw. The two screwdowns are interconnected with a magnetic coupling which, when energized, positively connects them and permits them to be operated in unison.

While many improvements have been made and many more are being developed, there still remains much work to be done in improving the speed and efficiency of these mills. For example, much progress should and probably will be made in the manufacture of better quality rolls for use on high-pressure mills. As matters stand today, the problem of rolling is the problem of rolls. Mills now are built with capacity limited entirely by the ability of the rolls to do the work. In other words, the mechanical design of mills has been developed to the point where bearing capacity and all other component parts exceed the capacity of the rolls. It will be interesting to watch the many new features being introduced daily and to check back on them historically to see how old some of the new ideas are.

Side view of cluster mill showing method of mounting the backing rolls in babbitted bearings. Tapered roller bearings now are used to conserve power

Booklet Discusses Refractory Arches and Walls

Designers and users of sectionally suspended refractory arches and walls will be interested in the new 80-page booklet published by the M. H. Detrick Co., 140 South Dearborn street, Chicago. Replete with illustrations of installations and representative sketches, the booklet has as its purpose the assistance of the designer of modern furnaces in the solution of problems of economic refractory furnace construction.

Two classes of data are available —fundamentals and scientific information. Each is discussed in detail, yielding much valuable information in designing the initial layout for a furnace. Further information on standard wall, arch and floor dimensions facilitates the early preparation of a furnace design dimensioned closely to final form. Flat suspended arches for furnace roofs and the tops of boiler settings, air-cooled walls and insulated walls, as developed by the Detrick company, are described and typical installation methods and applications are cited.

Unusual Interest Shown in Oil Burner Show

Manufacturers of oil burning equipment and accessories have displayed unusual interest in the eighth annual oil burner show to be held in the Gimbel building, Philadelphia, April 13-18, according to the American Oil Burner association, sponsor of the exposition. The space reserved up to January was far ahead of the total at the same time in previous years. The innovation last year in opening the show to the general public as well as dealers and manufacturers is believed to have quickened interest in the event. Sessions of the meeting of the association will be held in the Benjamin Franklin hotel.

Design and Technique Are Factors in 18-8 Welding

Manufacturers engaged in fabricating equipment from 18-8 chrome-nickel heat, acid and corrosion resisting steels by welding processes have come to the definite conclusion that success depends largely upon two factors; first, design, and second, technique. The Allegheny Steel Co., Brackenridge, Pa., a producer of this type of steel, has made hundreds of tests of various welds in its laboratories, including considerable work in co-operation with various fabricators of the steel.

In the welding of these alloys, according to L. W. Hostettler, engineer associated with the Allegheny company, one of the greatest problems is found to be accurate control of the gas and air in the acetylene process and of the amperage or power input in the electric process. Mr. Hostettler states that if 100 represents the tolerance allowable to make good commercial welds in mild steel, then 10 would represent the tolerance allowable in making commercial welds in the alloys under discussion, and it is absolutely necessary for the welder to have equipment which will provide much more accurate control than is required for most other metals.

Inasmuch as the various types of straight chrome iron and the 18-8 alloys embraced in the corrosion-resisting group have entirely different characteristics so far as thermoconductivity, electrical resistance and expansion prohibition is concerned, it is necessary in the design to take all these factors into consideration for a successful job.

Issues Report of Conferences

A report of seven years' service to the industries of Indiana in the field of foremanship conferences conducted by the engineering extension department of Purdue university, Lafayette, Ind., recently has been issued. The 61-page booklet lists policies of the foremanship conferences; companies served, numbering in the neighborhood of 400; various products manufactured; arrangements for the meetings, etc.

Offer Graduate Courses

Graduate courses offered and research fellowships available in chemical and metallurgical engineering at the University of Michigan, Ann Arbor, Mich., are outlined in Official Publication No. 21, of the university, entitled "Chemical Engineering." The graduate programs are arranged in four divisions, general chemical engineering, metallurgical engineering, gas engineering and organic chemical industries. Several fellowships and research assistantships will be available for graduate students next year. Application should be made by March 1.

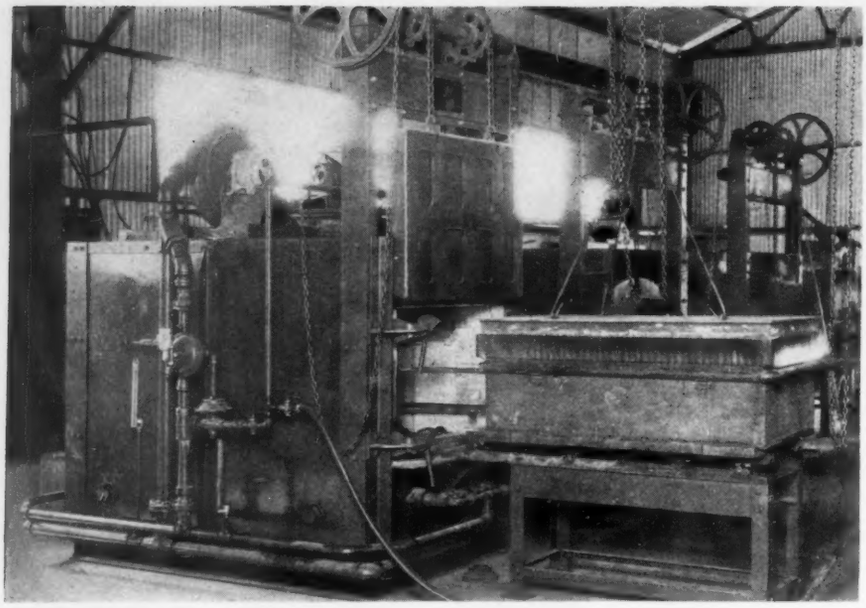


Fig. 1—The nitriding box is provided with atmospheric burners, tapped off the gas line, to melt the lead seal. The blower and arrangement of pipes for air and air-gas mixtures are shown at the left of the illustration

MAINTENANCE of uniform temperature over long periods of time is the problem confronting operators of commercial nitriding furnaces. The accompanying article describes a furnace accomplishing this through modified burner design and positive circulation of hot gases, and is abstracted from a paper presented at the National Western Metal Congress in San Francisco, Feb. 16-20. The author, James H. Knapp, is president of the James H. Knapp Co. Inc., industrial furnace engineers, Los Angeles.

Temperature Control a Feature of New Nitriding Furnace

BY JAMES H. KNAPP
James H. Knapp Co. Inc.

NITRIDING presents to the furnace manufacturer a problem of maintaining a uniform temperature of approximately 960 degrees Fahr. over a long period of time. With the standard types of gas furnaces this temperature and temperatures below this point are difficult to maintain uniformly, since actual combustion temperature or flame temperature of the fuel, at the point of combustion, is so far in excess of the desired temperature in the furnace. Some means must be provided within the furnace to reduce this flame temperature so that no danger exists of overheating in one or more spots in the furnace chamber.

Standard under-fired semimuffle designed furnaces, while suitable for temperatures of from 1200 degrees Fahr. and up, are not so satisfactory for temperatures below 1200 degrees Fahr. because of the small amount of heat obtained from radiation, and because of the high differential between the flame or combustion temperature and the temperature desired. Also this type of furnace is entirely impractical for temperatures below 800 to 900 degrees, as below these temperatures no effect is obtained from radiation.

In designing a new type of gas fired unit, known as the Convecto furnace, especially adapted to low-temperature operation, two main problems were met. First, because of the extreme temperature differential between the flame temperature of the fuel and the temperature desired a means had to be devised to break down this differential; and second, because of the fact that the heat is transferred by convection the furnace had to be designed to insure a uniform and rapid circulation of the hot gases throughout the entire furnace chamber.

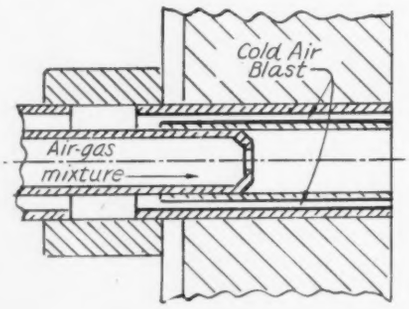


Fig. 2—Cross sectional diagrammatic sketch of gas burner, showing arrangement for blowing cold air around combustion zone

Fig. 2 shows a diagrammatic arrangement of the burner which aids in the solution of the first problem. The inner pipe carries a mixture of gas and air properly proportioned for perfect combustion, and as this gas and air mixture flows from the inner pipe it burns in a cone off the end of the second pipe. This combustion naturally would result in a higher temperature than the temperature desired in the furnace, and a spot of localized heat. However, such a condition is overcome by blowing cold air around this second pipe through the annular space between the second pipe and the third or outside pipe.

Close Regulation Possible

The flow of this cold air can be controlled and regulated to drop the temperature of the zone of combustion to any desired point. It will be seen that, as cold air is blown around the cone of flame, the hot flame mixes with the cold air, this being diluted in heat intensity; and by varying the volume of this cold air naturally the actual temperature of the resulting mixture is varied.

The second problem of insuring a uniform distribution of the hot gases throughout the furnace chamber, is solved by setting up a positive circulation in the furnace chamber.

Fig. 3 shows typical sectional side elevation and sectional plan views of the furnace which is fired by four burners of the type and design already described. These burners fire through two openings, on each end of the furnace, and shown in the sectional side elevation and the sectional plan views. The stream of gas and air from

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them passes, through a hole of large diameter in a secondary wall, into the actual combustion chamber underneath the main heating chamber of the furnace.

The velocity of these streams of air and gas, passing through the large hole, creates a minus pressure in the flue system marked *B* in the plan view of the drawing. The large hole above mentioned, is indicated by the letter *A* and the combustion chamber by the letter *C*. Creating a minus pressure in the flue system *B*, which connects by means of the holes marked *D* into the bottom part of the main heating chamber, will pull the gases in the main heating chamber downward into this flue system. The hot gases pass from the combustion chamber *C* into the main heating chamber through the flues marked *E*, therefore, if these gases are drawn sharply down toward the center of the bottom of the chamber, a rapid agitation and complete circulation of the gases is obtained.

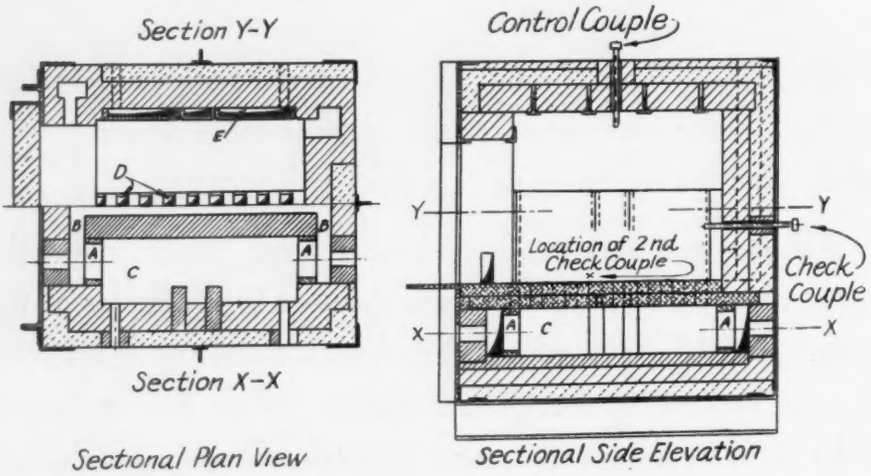


Fig. 3—Cross section plan and elevation views of the furnace showing heating chamber, combustion chamber, location of thermocouples, etc.

The excess air and burned gas leave the furnace through vents located in the rear wall and in the door jamb. The opening to these vents is close to the hearth level. Control of the operating pressure in the furnace is obtained by regulation of the opening of these vents where they leave the furnace at the top. This arrangement of flues and the method described gives uniform distribution of the heat.

Air for the operation of the unit is supplied by a centrifugal-type blower, direct connected to a motor, and mounted at the top and to one side of the center of the furnace. The air from this system, is divided by a Y-conection shown, and is supplied first to the gas and air mixer and second to the air cooling or diluting system. This piping arrangement is shown in Fig. 1, an illustration of the furnace.

The gas and air for the burners is mixed automatically in correct proportion for perfect combustion by means of a proportional mixer of the McKee type. This proportional mixer is complete with a gas regulator which reduces the gas line pressure to zero or atmosphere. By means of a venturi throat in the mixer proper a minus pressure is created on the outlet side of this zero regulator as air flows through the venturi tube. Correct mixture of gas and air is obtained by adjustment of a gas valve in the mixture chamber. Then an increase or decrease of the vacuum, caused by an increase or decrease of the air flow, will increase or decrease the supply of gas always in the correct proportion for proper combustion at the burner tips.

Automatic control of the supply of gas and air fed to the furnace is obtained by an automatic valve of the McKee type, operated from a solenoid and in turn controlled from a potentiometer-type controller.

This regulating mechanism will vary the amount of gas and air supplied to the burners and therefore will vary the input of heat to the furnace between predetermined limits, maximum and minimum. The actual control of the degree of temperature at which the furnace will operate is obtained, however, by the amount of cold air which is allowed to pass through the system and intermingle or dilute the above mentioned fuel supply and in turn reduce the temperature. For low temperatures naturally a greater amount of air will be allowed to pass through the air system.

The amount of air passing through the air system can be controlled by means of a blast gage in the air line. Determination of the amount of air supplied is indicated by means of a manometer on this line. By means of this manometer a duplication of conditions is easy to obtain, for if it is found that to hold a temperature of 450 degrees Fahr. requires an amount of air passing through the system that gives a pressure of 6½ inches on the manometer, then to reproduce this same temperature the diluting air is set at the same manometer pressure. Thus it is a simple matter to calibrate the furnace for various operating temperatures. Tests have been conducted which show that this furnace can be operated satisfactorily at temperatures as low as 300 degrees Fahr., and as high as 1200 degrees Fahr., with close regulation of temperatures and uniform distribution of heat in the furnace chamber.

The nitriding box used is of the lead-seal type and is provided with atmospheric burners to melt the lead seal. These burners are tapped from the gas line, ahead of the regulator on the proportional mixer for the burner system, and after the box is loaded with work and the lid put in place, they are lighted and the lead in the seal melted so that the lid of the box can close and drop to its lowest position. This setup is shown in the illustration. The truck and nitriding box are then pushed into the heating chamber of the furnace.

Safety Devices Provided

As the nitriding operation extends over a considerable period of time safety devices are installed in the gas line, so that should there be an interruption of electric current, causing the fan to stop, the gas line will be closed automatically. A second valve is placed in the gas line, which automatically closes should there be any stoppage of the gas supply which would put out the burners. These precautions must be taken for, on a nitriding heat, where a temperature of only 960 degrees Fahr. is maintained in the heating chamber of the furnace, the combustion chamber does not rise to a temperature at which gas would ignite from the radiation of the brickwork, and should a momentary cessation of the air or the gas supply occur, the furnace would not relight itself.

Of course, further developments could be made and pilot light equipment installed which would automatically relight the burners, but in modern plants at the present time, cessations of the electric current or the gas supply are of such rare occurrence that the expense of the additional pilot equipment is not worthwhile.

The furnace shown in the illustrations, has been in operation over a period of six months, doing nitriding work the majority of the time and in all that period has been automatically shut down only once due to interruption of the electric power.

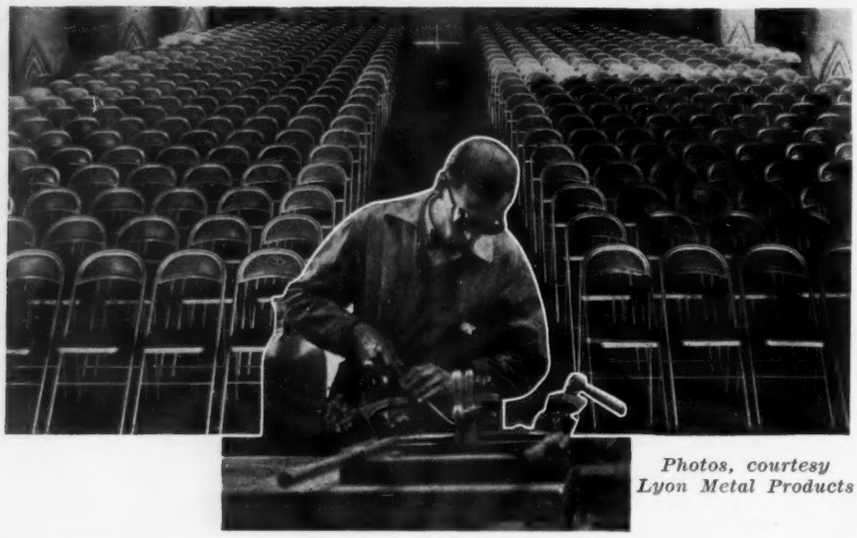
The furnace is 36 inches wide by 60 inches deep by 24 inches high, in the effective heating chamber, and it operates at a temperature of 960 degrees Fahr. for nitriding work, with an hourly consumption of 75 cubic feet of natural gas, having a B.t.u. value of approximately 1150 per thousand cubic feet.

The Industrial Locomotive goes *'Steel Casting'*

68,000 pounds of steel casting now supplants the one-time fabricated underframe of Mack's new 60 ton Industrial Locomotive—eliminating not only costly labor in assemblage, but incorporating as one unit many vitals such as truck pedestals, brake rigging hangers and air cylinder supports. Being cast integral insures against any possible misalignment of parts due to loose rivets or bolted sections, warranting rigidity throughout the life of the locomotive.

Designed, patterned, cast and machined by Birdsboro—this huge, one piece casting represents, in full, the completeness of an organization serving both industry and the railroad . . . A service that provides for speed and efficient handling the day your order is received.

BIRDSBORO
STEEL FOUNDRY AND MACHINE COMPANY
DESIGNERS AND BUILDERS
BIRDSBORO, PENNSYLVANIA



Photos, courtesy Lyon Metal Products

Welding portable steel chair parts

Large Uses of Steel in Small Ways

185th Article ◆ ◆ Folding Chairs

DEMAND for folding steel chairs is increasing steadily, according to leading manufacturers, and this applies especially to the better types which rank in a class with furniture. There is a large variety of them, many incorporating patented features of construction. One company which began producing chairs in its stamping plant a year ago has since made 50,000 of them. Estimates by the principal manufacturers indicate no less than 300 tons of steel is consumed annually in the production of folding chairs.

The modern trend toward economizing on space, making rooms do double or triple duty is responsible for the growing market for such chairs. A school auditorium is a lecture class room in the day time, and a basketball court at night. The chairs must be folded up and moved off the floor. A hotel ballroom may have to seat hundreds or thousands of guests for a convention, and a few hours later the chairs must be removed for a dance. Hotel sample rooms must be outfitted to seat a large number of buyers. A manufacturer's lobby may serve only as a lobby for days, and then, as a room for a sales conference. Hospitals, night clubs, apartment houses, even the rage for bridge and bridge parties in private homes, have all contributed to the demand. Chair rental agencies have them by the thousands, undertakers are using them, churches and amusement parks are good buyers.

The steel chairs "have it over" the wood chairs for general assembly purposes in that less noise is made in folding and moving them; slats do not break, there are no nails to catch clothing, and the better types are more comfortable. Comfort, safety, durability and appearance are important considerations, and the manufacturers of steel chairs are trying to surpass one another in these essentials.

Construction Is Simple

The best types on the market today have about seven main parts, including a tube bent U-shape, the U being inverted in assembly to support the backrest and to form the fore legs. Two short lengths of tube are hinged to the U to form the rear legs. A steel rod braces the fore legs, and another the rear legs. The frame for the seat is a flat narrow piece of steel, and the seat itself may be of 3-ply laminated wood or steel "cane." The backrest fits into the upper part of the U, and is of steel "cane" or all-steel, upholstered. There are only three moving parts in such a chair. The hinges are pinch and tear-proof. Seat pivots are made of high-carbon machine steel, with a shoulder to eliminate weaving, and the cross braces on the legs are fastened with expansion dowels.

Rubber feet are forced into the ends of the tubes, and expanded by means of a screw to hold them securely in place. A base coat of heavy enamel of any color desired is baked on the steel, and this coat is covered with a thick coat of lacquer. Such chairs weigh from 8.7 pounds to 10.5 pounds each.

Another type of chair for which there is a large demand is made of 11 parts. Some rods and tubes are used in these chairs but for the most part they are fabricated of 16, 18 and 20-gage steel flats. Still simpler types of chairs having canvas seats and backrests are made of narrow flat strips of steel; indeed, they range all the way to simple steel tripods, with cloth seats, for camp use and other general knock-about purposes.

The more durable and attractive types may be "ganged" in sections of two, three or four, held together with steel tubes fastened to the under part of the seats, and by clamps fastening the front and rear legs of adjoining chairs.

Steel Does Not Fail from Fatigue, States Expert

Making an address in Chicago recently, H. F. Moore, research professor of engineering materials, University of Illinois, Urbana, Ill., stated that there is no such thing as steel fatigue. Extensive tests have revealed that imperfections in the metal cause steel to fracture. According to Professor Moore, the common conception is that steel when subjected to constant vibration behaves as if fatigued. "What really happens is not," he said, "correctly speaking, fatigue at all. At some minute imperfection in the metal a crack starts and spreads just as a crack in a glass showcase spreads when people keep leaning on it. Eventually this crack spreads so far that this piece breaks."

Manganese-Silicon Alloys as Deoxidizers

The use of manganese-silicon alloys for deoxidizing steel in the open-hearth furnace has been investigated by the metallurgical section of the Pittsburgh experiment station, bureau of mines, in co-operation with the Carnegie Institute of Technology and metallurgical advisory board. About 40 heats of acid and basic steel have been made using manganese-silicon alloys for deoxidation; best results were obtained with alloys containing 5½ parts of manganese to 1 of silicon. Steels so treated are considerably cleaner than steel deoxidized with ferromanganese and ferrosilicon, and also are more uniform from heat to heat.

Manufacturing time *cut 1/4 to 1/2 by* ARC-WELDING

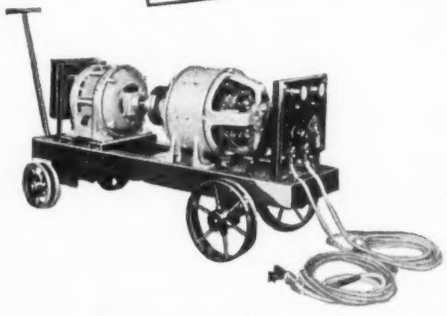
Cable reel trailer designed by American Telephone & Telegraph Company —fabricated by arc-welding by Utility Supply Co., Clintonville, Wis.

Whatever the Metal
Whatever the Industry
ARC-WELD
with
WILSON
Machines and Wire

IN THE manufacture of cable reel trailers, the production time has been cut *¼ to ½* by the use of *arc-welding* instead of riveting.

Formerly, it was necessary to bend the extended tongue of a tipped channel at a right angle and then rivet down the part which passed around the angle. Arc-welding has entirely eliminated this process, as well as shearing, drilling and riveting. Moreover, these trailers—arc-welded throughout by Wilson Machines—are now built of *lighter tubing* than could be used if the parts were riveted.

Greater strength, greater rigidity, lower production cost—these are the advantages of arc-welding. *Simple operation, close control, perfect commutation*—these are the features of *Wilson Machines* which enable you to secure *all* of the advantages of arc-welding. Write for details.



One-operator, electric-motor driven Wilson Model S Welder. The complete line of Wilson Machines includes one-operator Type 200, Type 300, Type 400 ampere units; also two-operator Type 400, Type 600, Type 800 ampere units (one hour rating).

WILSON WELDER & METALS CO. INC., 24 WILSON BUILDING, NORTH BERGEN, N. J.

WILSON

WELDING MACHINES AND WELDING WIRE

Inspection Service for Welded Structures Seen as Need

BY H. L. WHITTEMORE
Bureau of Standards, Washington

AS CHANGES in industrial processes come more and more rapidly, the difficulty of obtaining workmen skilled in new processes and methods becomes greater. A good example is fusion welding. Many welders apply for the jobs, but comparatively few of them make satisfactory welds. Training courses in the fundamentals of welding become necessary and are being provided by both educational and commercial organizations.

The success of a welded structure of any kind depends not only on the care and skill of the welder but upon the base metal, the welding rod and gases, the torch and other apparatus, and the design of the joint. The skill of the welder is only one of several factors which vitally affect the finished work. It is usual, in examining welders, to include all these factors except the design of the join by having the welder use the materials, equipment and procedure which are to be used for work on which he is to be employed. Any statement that a workman is a good welder, which does not also give, rather fully, the conditions under which he makes satisfactory welds is just as much nonsense as the bare statement that he is a "good" man.

Methods Are Developed

It becomes evident, then, that testing the welders and testing the welds are interlocked so closely it is impracticable to separate them. Everyone concerned is satisfied if the welds are satisfactory.

Although satisfactory oxyacetylene welds have been made for many years, only during the past few years have methods been crystallized into definite procedures for particular jobs. The "know-how" in the mind of the expert welder, for many jobs, has been put down in black and white for the use of the entire gas welding industry, and tests are given in the procedure control for determining the quality of the welds.

Although progress which has been made in procedure controls and tests has been gratifying and will in most cases insure satisfactory welded structures, the building officials of large cities, the insurance people, and the men who pay the bills do not hail welding with the enthusiasm which might be expected. When it is proposed to fabricate a design by welding, these gentlemen often hesitate to approve. Often they admit readily that welding has been used satisfactorily for similar work. Finally, it is learned that they want to know what assurance they will have that the welds will be good. A statement as to the financial standing of the company taking the contract apparently makes no impression.

Something must be done. How can these gentlemen whose approval is necessary, be convinced that the welding will meet their expectations. Someone suggests that these gentlemen inspect and test the work as it progresses, but they can't. They have neither the technical knowledge nor the training to undertake such work. As well expect the passenger who complains of delays due to fog at sea to take the bridge.

Special Service Required

The laboratories which inspect and test engineering materials have not, as yet, established a reputation for service of this kind in the field of welding. The urgent need at present is for a service which will study and criticize the suitability of a design for fabrication by welding, inspect, test and approve the materials and workmanship as the work progresses, and finally certify that the finished job complies with the specifications. The inspection service would in effect stake its reputation that the purchaser would have no reasonable cause for complaint. It should, therefore, be extremely cautious about certifying structures welded by new and untried methods. As this service is essentially the agent of the purchaser, it should be supported by the purchaser.

The contractor should not inspect and test for the purchaser for the same reasons that a lawyer cannot represent both the plaintiff and the defendant in a law suit.

Where is the organization which is ready and willing to "certify welds," which will not only make sure that the welds are right, but which follows methods which inspire confidence in both producer and consumer?

An inspection service of this kind should be hailed with delight by organizations doing welding because to a great extent it would relieve them of the necessity of maintaining a staff of welding engineers and supervisors. In small organizations employing only one or two welders, the design of welded structures with adequate supervision and tests is a serious financial burden. This work could well be cared for by an outside organization just as lawyers and certified accountants care for other phases of the business.

Suppose, for example, that a welding company fabricates a structure under contract which fails under unforeseen conditions, such as a tornado, causing a spectacular loss of life. Imagine the headlines in the press the next morning. Another disaster due to welding. Even if the fractures occurred at some distance from the welds, it would be extremely difficult to convince the investigators beginning with the coroner's jury that welding, a comparatively new process, was not the cause.

Welds Would Be Certified

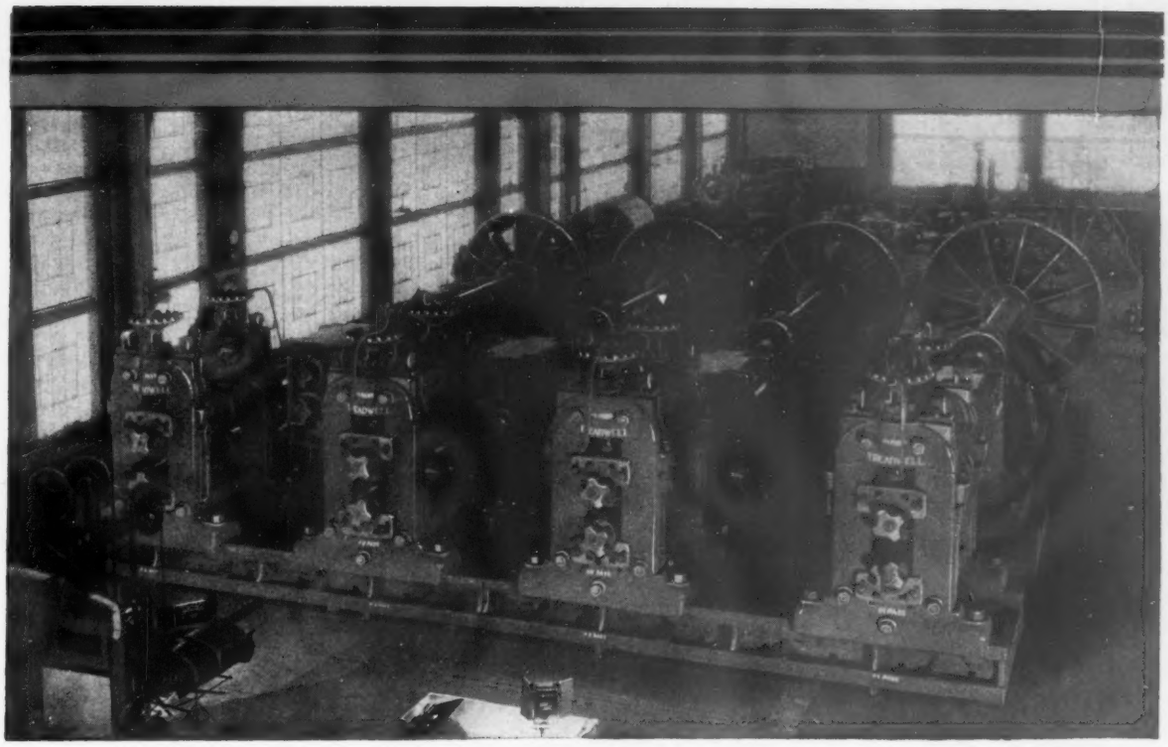
If the welding company immediately could produce certificates from a recognized inspection service showing that each welder on the job had fully met qualification tests, that the design was based upon the results of tests, it would force anyone who stated that the welds were at fault to prove his contention. These certificates might well be documents bearing the signature and a passport photograph of the welder, a statement of the essential results of the qualification tests, and sworn to before a notary by members of the staff of the inspection service.

A description of these certificates in the technical press would be effective advertising for companies engaged in welding work.

To prevent the inspection service from becoming autocratic in its decisions, the procedure controls and methods of inspecting and testing could be submitted for approval to the industry as represented by the International Acetylene association, the American Bureau of Welding, and similar organizations.

Illinois Coals Are Tested

Illinois coals and the results that can be expected of them in a boiler are presented in detail in a Bulletin No. 213 of the engineering experiment station of the University of Illinois, Urbana, Ill., entitled "Combustion Tests with Illinois Coals," by Alonzo P. Kratz, and Wilbur J. Woodruff, of the school of mechanical engineering. The actual performance of a given type of coal is governed both by the type of boiler setting and by a number of operating conditions. For best results, the latter must be adapted to the particular coal.



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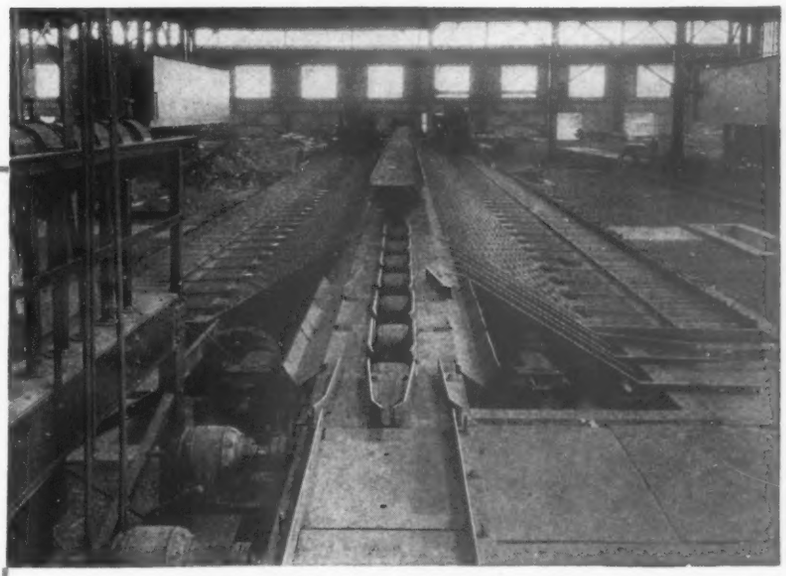


Hot Bed for 14-9 inch Merchant Mill

Treadwell Engineering Company
Easton, Pa.

High Temperatures Impose New Demands on Steels

POWER and its relation to business economics occupied chief interest at the fifth Midwest Power Engineering conference and the fourth national fuels meeting of the American Society of Mechanical Engineers at Hotel Stevens, Chicago, Feb. 10-13. The Midwest Engineering exposition simultaneously presented a cross section of the late developments in power machinery and appliances at the Coliseum, in which 225 manufacturers had about 85,000 square feet of show space.

The power engineering conference was divided into sessions on power economics, refrigeration and ventilation, developments in the electrical field, civil engineering session, and a number of luncheons, one of which was featured by an address by L. W. Spring, Crane Co., Chicago, on "High Temperature Metals for Power Plants." O. H. Caldwell, editor of *Electronics*, New York, was the speaker at the power engineering conference banquet, at which demonstrations also were given by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Requires Accurate Tests

In discussing high temperature metals Mr. Spring pointed out that superheating of steam has brought about a new interest in the testing of steels for steam power plants and oil refineries. He stated pressures up to 600 pounds per square inch are used generally, while several plants now are using 1400 pounds per square inch. New processes of oil refining also have had an influence on the steam plant. A recent inquiry for equipment named 1500 degrees Fahr. and 2500 pounds pressure as maxima for an experimental still.

Mr. Spring stated that the steam plant designer is determined to go ahead with temperature increases and already has definitely asked metallurgists and steelmakers for materials to stand service for 10 to 20 years at temperatures up to 1000 degrees Fahr. Stronger metals than carbon steel, or at least metals which lose less of their strength at high temperatures, are needed because of the requirements for 3500-pound pressures now being sought and to reduce the necessity for bulky valves and extraordinarily thick flanges. The effect of the temperatures upon materials was given as a factor more serious than the pressure problems. The "flow" or "creep" testing method was said to be closer to the actual truth as to the pressures and temperatures which metals will stand in continued service than many others. A question arises as to whether the engineer will want steel castings annealed completely enough to give the finest grain.

Besides the fact of insufficient tensile strength for fiber stresses and to take care of "creep," the question of metal fatigue often is brought up, Mr. Spring stated. While fatigue of overstressed metal is an extremely important factor at the lower temperatures, it becomes a much less serious factor as the temperature of operation rises. Apparently at temperatures of 750 degrees Fahr. or over, fatigue has lost most of its importance as a factor. Mr. Spring pointed out that austenitic steels show less loss of strength at the higher temperatures than do the pearlitic varieties. It was stated also that a question of chemical stability yet remains to be settled. Steels containing small amounts of nickel and chromium were reported to suffer much the same loss in strength at high temperatures as do the ordinary carbon steels. Nitralloy steel as a valve seat metal was described as giving most satisfactory results in steam service.

In the electrical field session, William H. Zorn, Detroit Edison Co., Detroit, discussed arc welding in the power plant, which included some 600 joints of pipe, 3 to 24 inches, with pressures up to 125 pounds. That company's welding work also included 80 miles of gas mains for the gas division, which was accomplished with welding generators driven by tractors.

Discuss Many Problems

The economics of fuel utilization, use of refinery waste fuels in modern steam plants, discussions of small stokers, types of furnaces, and suggestions as to the boiler plant of the future, were given attention at the fuels meetings. Prominent in the fuels discussions also was the subject of pulverized coal firing and its developments.

A review of the development of burning pulverized coal under steam boilers was given by Henry Kreisinger, Combustion Engineering Corp., N. Y., in which he pointed out difficulties of early installations and changes in the design of furnaces and burners. Adoption of more advantageous methods of firing and the present practices in rates of combustion in furnaces of various designs, including factors at set limitations, also were discussed. Mr. Kreisinger pointed out that intensive mixing in the furnace is a most important factor within the control of the designer and operator for producing rapid combustion, and that mixing outside of the furnace is ineffective in producing rapid combustion, as a uniform mixture of air and coal cannot be maintained.

Conversion of coal-fired boilers and furnaces to gas firing also was under consideration. William D. Edwards, mechanical engineer, Memphis Power & Light Co., Memphis, Tenn., presented actual operating data for various types of plants converted to gas fuel. He said costs of operation have proved gas to be comparable with coal and materially lower than the average fuel oil use.

Equipment and appliances covering generation, utilization and distribution of power were features of the engineering exposition, which included heating equipment, stokers, coal and ash handling, and water screening equipment. Among the exhibits was an "educational boiler" in which coals were tested. The latter installation was kept in actual operation under test conditions, intending to show that Middle Western soft coal could be burned smokelessly and economically.

Blast Furnace and Coke Oven Problems Discussed

Eastern States Blast Furnaces and Coke Oven association held its regular midwinter meeting, Feb. 13, at the William Penn hotel, Pittsburgh, the program consisting of an all-day discussion of blast furnace and coke oven practice. Separate meetings of the two groups were conducted during the morning session.

L. E. Riddle, superintendent of blast furnaces, Duquesne plant, Carnegie Steel Co., gave a detailed description of experiences in operation of furnaces under low wind during a general discussion on that subject. Diversified opinions were expressed with regard to the advisability of banking blast furnaces rather than blowing them out over periods of various lengths. Other subjects discussed before the blast furnace group included "Beneficiation of Ores" and "The Effect of Silicates Upon the Quality of Pig Iron." Dr. C. H. Herty Jr., bureau of mines, Pittsburgh, opened the discussion on the latter subject with a talk on the relation between inclusions in steel and the presence of silicates in iron.

Coke oven men considered three subjects during their session: "Methods and Advantages of Washing Coal," "Advantages and Disadvantages of the Different Methods of Handling By-Product Coke Ovens During Periods of Intermittent Operation," and "Economic Value of Tar Distillation."

A. J. Boynton, vice president, H. A. Brassert & Co., Chicago, addressed a joint meeting in the afternoon, describing his observations of conditions in Russia, gathered during his recent stay in that country. He presented figures on results of the first two years of the Russian five-year plan with ref-

erence to the iron and steel industry. Pig iron and steel ingot production last year rose above the prewar level and now is at about one-half the goal set for the end of the five-year plan, he stated. Ralph H. Sweetser, consulting engineer, Columbus, spoke on the importance of maintaining uniformity in coking coals in order to obtain the best blast furnace fuel.

I. Lamont Hughes, president, Carnegie Steel Co., Pittsburgh, spoke briefly at the dinner held that evening. The program was concluded by the presentation of a motion picture, "Plant Life," by the Koppers Co.

Standards for Foundry Equipment To Be Set up

Standardization of equipment used by foundries manufacturing a wide variety of metal products from radiators to steel locomotive frames has been decided upon by the American Standards association, New York.

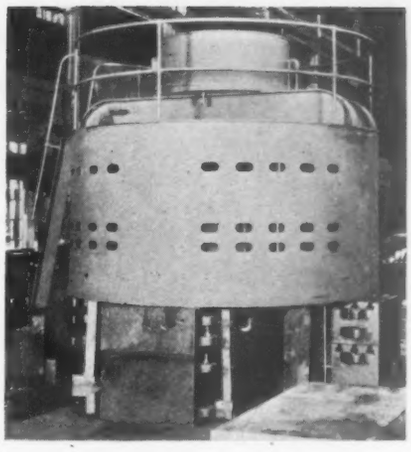
Under technical leadership of the American Society of Mechanical Engineers and the American Foundrymen's association, the project will be placed in the hands of a working committee representing manufacturers of foundry equipment, government metallurgical specialists, and important branches of the foundry industries.

The work will be carried on under the administrative procedure of the American Standards association and will lead ultimately to preparation of a group of authoritative American standards for foundry equipment.

Design Synchronous Motors for Three-Speed Operation

Unusual synchronous motor construction is embodied in the design of four vertical motors recently built by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., for use at the River Rouge plant of the Ford Motor Co. The motors, which will be used to drive propeller-type pumps designed to pump large quantities of water at low head, were developed as three-speed machines, an unusual factor in synchronous motor design. However, the present machines, one being shown in the illustration above, are built for two-speed operation with provisions made for adding an additional speed unit later. The future until will be rated 300 horsepower at 200 revolutions per minute and will be in the form of a separate armature and rotor installed in a space provided for it on the present frame and shaft. The present installation is rated 700 horsepower at 277 revolutions per minute and 350 horsepower at 138 revolutions per minute, change in speed being obtained by changing rotor and stator connections.

Because of the characteristics of the pumps, the motors were designed with extremely high pull in torque. The starting sequence is automatic with the motor control interlocked with the pump valve motor control. Operating speed is obtained by selector pushbutton control. The motor is always started on the low speed winding regardless of the operating speed desired. If the high or intermediate speed is desired, transfer to the correct winding connections is automatically established at the proper time.



Vertical synchronous motor of two-speed type, for driving large water pump

Compiles Abstracts

Articles on fatigue of metals under repeated stress, which have appeared in the technical press from July 1, 1929, to June 30, 1930, have been abstracted by the American Society for Testing Materials, Philadelphia, and are available for distribution in pamphlet form. This publication was prepared by the society's research committee and is the second to be issued.

Announces Production of 6 to 24-Inch Diameter Spiral Welded Pipe

SPIRAL welded pipe, one of the most recent developments in the field of steel pipe manufacture, is now being produced in a new department of the American Rolling Mill Co., Middletown, O. Among advantages claimed for this type of pipe are lighter weight, easier handling, long sections which reduce the number of field joints, smooth inside walls which reduce friction and pumping costs, and decreased shipping and handling costs.

One of the objectives of the development engineers who have spent considerable time in experimentation and experimental production of the pipe, was to develop a process which would fit in efficiently with other operations of the company. Since coiled strip in lengths up to 200 feet, 16-gage and heavier, is an intermediate product in one of the continuous rolling processes, it was decided to "detour" this semifinished product to forming and welding machines for producing the spiral welded pipe.

Strip Fed at Angle

The coils are first placed in a decoiling device at one end of the pipe machine, unwound, flattened and then fed into the forming rolls and welding mechanism. The spiral seam is produced by feeding the strip into the machine at an angle of approximately 45 degrees. The length of the coils eliminates the necessity for frequent stopping of the machine while a cut-off mechanism synchronized with the speed of the welded pipe assures accurately gaged lengths at the delivery end of the machine.

Complete manufacturing operations involve two separate and distinct steps; first, the fabrication; then follows inspection and testing. The welded pipe is tested hydraulically at twice the safe working pressure. The latter is determined by using a fiber stress based on the ultimate tensile strength, with a safety factor of four. The spiral weld is said to act as a stiff spiral band about the pipe, imparting rigidity to the walls; also to balance all shrinkage strains, making for a straight, true-round pipe.

Length up to 40 Feet

The American Rolling Mill Co. is manufacturing the pipe in jointless lengths up to 40 feet. No interior grooves or ridges are present and no projecting bands or seams add to non-utilized weight. The pipe lends itself readily to welding into a line and can be used with any of the standard couplings. Sizes now being supplied range from 6 to 24 inches in diameter, and from 12-gage to ⅜-inch in wall thickness. Mill coat, asphalt inside and out, or galvanized finishes can be furnished.

The original sheet mill plant of the company has been converted into a modern pipe manufacturing plant, with C. C. Clarke as superintendent. Sales will be handled by a separate sales division of the spiral welded pipe department, headed by R. C. Beam who has followed the development of the new pipe closely.

Greater Strength

IN SHEPARD WELDED

BOX girder crane bridge, of wide flanged rolled steel sections so united by welding as not to subject the welds to direct load stresses. Load carrying members, unreduced in section because no rivet holes are used. They combine to produce great strength and rigidity, with a minimum of weight, in the Shepard Welded Box Girder.

Shepard's Compact Crane Trolley, too, is of wrought steel. It is welded wherever advisable to assure greatest strength, without the burden of unnecessary weight. The result is a Shepard Welded Compact Crane that allows of lighter runways and buildings, plus faster starting and stopping.

Then, too, sectionalized trolley construction of standardized interchangeable units provides the Shepard Trolley precisely suited to the job—minus the cost of specialization. Some of the various types of trolleys thus obtainable are illustrated at the right. They are duplicates in quality but varied in design to fit the service. Detailed description of this feature plus facts concerning the entire line of Shepard Traveling Cranes are available in bulletin form. You can obtain copies by means of the coupon. Merely sign it and drop it in the mail.

SHEPARD NILES
CRANE & HOIST CORPORATION
Montour Falls, N. Y.
Works, Montour Falls and Philadelphia, Pa.

SHEPARD
CRANE & HOIST DIVISION

Useful Properties Are Afforded by Manganese Steel

BY D. H. YOUNG
American Manganese Steel Co.

Manganese steel made in the electric furnace has many distinctive properties but must be handled correctly while fluid

THOUGH most steels in common use contain manganese in small quantities, the term, manganese steel, generally is accepted as designating a heat treated alloy of iron containing 10 to 14 per cent of manganese and 0.80 to 1.50 per cent of carbon. Manganese steel produced entirely in the electric furnace possesses a higher degree of uniformity and somewhat better physical characteristics than if produced by other methods. Unless handled correctly while fluid, it may not possess the desired strength and toughness when cast, even though the proportions of its main constituents are correct.

Manganese steel has a rather unexpected ability to fill molds of intricate shape, and is poured at about 2640 degrees Fahr. compared with 2240 degrees Fahr. in the case of cast iron. The higher melting temperature of manganese steel increases its tendency to fuse the surface of the mold; its shrinkage is approximately $\frac{1}{8}$-inch per foot. This necessitates unusual care in both the design of large castings and in the provisions which must be made to accomodate this shrinkage in the mold. Manganese steel castings are free from blowholes, and aside from having a rather long, mushy range during cooling, present no especial difficulty to the foundrymen.

Produces Different Effect

The heat treatment of manganese steel in both quenching and annealing produces effects which are opposite to those obtained in most other steels; quenching producing an increase in toughness and ductility and making the steel nonmagnetic, while annealing increases its hardness, brittleness and its magnetic susceptibility. In order to secure the maximum toughness and ductility, manganese steel must be quenched in cold water from the temperatures between 1750 to 2000 degrees Fahr. A wide variation in the heating rate makes little difference, but it is desirable that the cooling rate be as rapid as possible.

In its toughened condition, manganese steel will have an ultimate strength of 100,000 to 140,000 pounds a square inch, with a yield point of approximately 50,000 pounds. The position of this yield point, however, generally is difficult to determine, because manganese steel becomes much stronger as the result of deformation, or cold working, and this increase in strength up to its breaking point is at a higher rate than its reduction of area, so that the first yield point immediately is obscured by an increase in strength. This peculiarity accounts for its unusual elongation, which will vary between 40 and 70 per cent.

MANGANESE steel is used in some form by practically every industry in this country. While it formerly was considered impracticable to make manganese steel castings of more than a few pounds, they now are produced up to 15 tons without difficulty. The accompanying article is abstracted from a paper read at the National Western Metal Congress, San Francisco, Feb. 16-20, by D. H. Young, western manager, American Manganese Steel Co., Oakland, Calif.

Reverse Condition Applies

The reduction of area is always less than the elongation. This is the reverse of the usual condition for all simple and most alloy steels. The brinell hardness number is usually about 200 for the steel as cast, but if subjected to deformation by bending or abrasion, this hardness may be increased to the neighborhood of 600, which compares favorably with the hardest materials. The specific magnetism is usually under 0.10 per cent as compared with iron at 100 per cent. Scleroscope hardness is usually about 35, but cold working will increase this to about 70.

Reheating and slow cooling of manganese steel produces some astonishing results. If soaked at a temperature of 850 degrees Fahr. for one hour, its hardness will remain about the same as its original treated condition, but a considerable diminution of its toughness will result. The same material, however, soaked for three hours at a temperature of 850 degrees Fahr. and cooled slowly is found to be brittle. Its yield point will be increased, its ultimate strength will be diminished, and its elongation will be in the neighborhood of 2 per cent, with about 4 per cent reduction in area. The brinell hardness will be approximately 300, but the specific magnetism will remain for the most part unchanged.

By continuing this soaking process

for 60 hours, the metal becomes still more brittle, and magnetic, its specific magnetism being 40 to 50 per cent as compared with 100 per cent for Swedish iron. By microscopical examination, it will be found that the structure of the steel has been changed and that in place of purely austenitic structure, which is normal for treated manganese steel, there now is found an acicular structure, due to the deposition of double carbides of iron and manganese in this form. These carbides are harder than matrix, and apparently account for the increase in hardness of the annealed material. At present, there appears no satisfactory explanation of the change in magnetic properties.

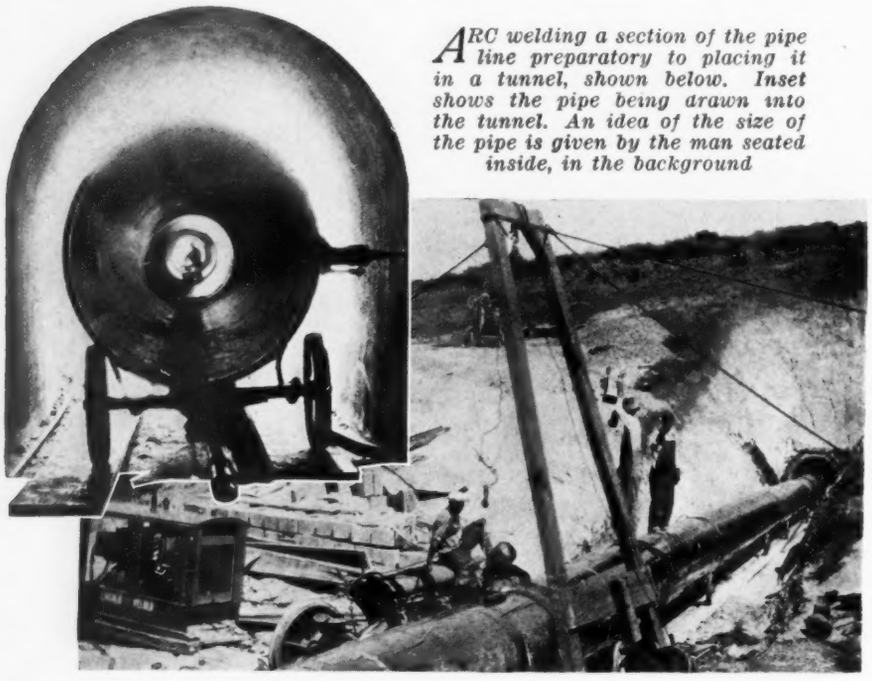
If this annealed material now is reheated to the higher treating temperature, a critical point will appear in the heating curve at 1240 degrees Fahr. At this point, the carbides commence to redissolve and the full toughness, ductility, and nonmagnetic qualities are regained entirely if the steel subsequently is quenched from the high temperature. Little is known about the special usefulness of manganese steel if subjected to this annealing process, but it is obvious that for ordinary uses where extreme toughness and great strength are desirable, the reheating of manganese steel should be avoided unless it is to be followed by the usual quenching, which will restore its strength.

Product Is Durable

The extraordinary durability of manganese steel, when subjected to abrasion or the impact of hard materials, does not result from its initial hardness, which is rather low, but from the unique way in which it is affected by mechanical deformation.

No other material behaves in this manner to such an extent. The original hardness of 200 brinell may be increased by deformation to as high as 580 brinell, which is close to glass-scratching hardness. Therein lies the secret of the durability of manganese steel.

Four Tunnels in New Arc Welded Water Line for San Diego



ARC welding a section of the pipe line preparatory to placing it in a tunnel, shown below. Inset shows the pipe being drawn into the tunnel. An idea of the size of the pipe is given by the man seated inside, in the background

PHENOMENAL growth, both in territory and population, of the city of San Diego, Calif., within the last 20 years repeatedly has brought that city face to face with a problem of furnishing a water supply in keeping with its size. For this reason the city recently has made the third major improvement since 1914, the construction of a large transmission pipe line, known as the Otay-San Diego line, which is to bring water from the Otay reservoir, a distance of approximately 19 miles. This new line is constructed of steel pipe fabricated by the electric arc welding process.

This new steel pipe line is to replace a wood-stave line which has been in service since 1901. It will have a somewhat greater carrying capacity due to its larger diameter and greater pressure capacity. The old wooden line had a capacity of 10,000,000 gallons daily but improvements in reservoirs require the new line to handle about 17,000,000 gallons daily. In the future booster pumps will be installed to raise this capacity to 25,000,000 gallons per day.

Approximately 86,000 linear feet of electric arc welded steel pipe will be used in this new water line. About half of this footage will be 40-inch pipe and the other half 36-inch pipe. Varying thicknesses of plate are used in the fabrication of this pipe. due to varying pressure requirements. All pipe used in the line was manufactured by the Western Pipe & Steel Co., San Francisco.

In the construction of the line it was necessary to tunnel through four large hills. These tunnels were cut 6.5 feet high and 6 feet wide, the longest being 2150 feet in extent. The accompanying illustration shows a section of the pipe being arc welded before being drawn into one of the tunnels. The inset shows the pipe entering the tunnel.

All pipe used in this line was of the arc welded steel type, and with the exception of that for the tunnel all was dipped in hot asphaltum and wrapped with special felted fabric. Pipe for the tunnels was dipped but not wrapped.

How Joints Were Welded

All joints on the line were arc welded, the pipe being equipped with bell and spigot joints. On the heavier pipe two beads were used, and all points were welded both on the inside and the outside. The pipe sections as a general rule are about 30 feet long, but vary with the terrain. It is lined up and arc welded in sections, then tied into the main line.

Welding machines manufactured by the Lincoln Electric Co., Cleveland, were employed.

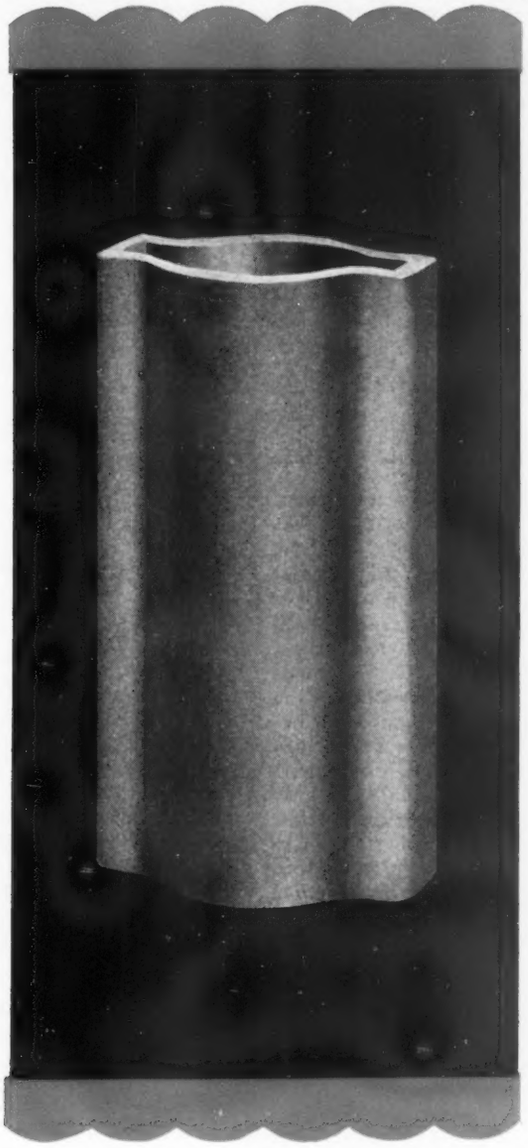
The use of the electric arc welding process in the fabrication of this line not only kept the cost to a minimum but also provided strength and rigidity. In a test of 10 miles of this line during construction only one major leak was found. The sharpness of the turns or the roughness of the terrain offered no difficulties for this type of construction, and required no special precautions or specially constructed pipe.

Will Address Engineers

Gerard Swope, president, General Electric Co., Schenectady, N. Y., will be the principal speaker at the annual banquet of the Engineers' Society of Western Pennsylvania to be held Feb. 26 at the William Penn hotel, Pittsburgh. G. G. Crawford, president, Jones & Laughlin Steel Corp., Pittsburgh, will serve as toastmaster.

CROSBY

SHEET METAL STAMPINGS



Intricate

Formed from a flat blank into this special shape—a seamless drawn Flow Meter Body Section of three-eighths inch steel, 26 pounds net weight. Intricate? Rather! But our engineers have made good on so many difficult things that it takes some involved job like this to test their abilities.

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Scanning the Technology of Steel

A Digest of Important Developments in Scientific Research, Engineering Progress and Operating Procedure Pertaining to the Production, Processing, Application and Performance of Steel

PRODUCTION:

Clean Steels

Formation and elimination of nonmetallic inclusions in the acid openhearth process, discussed by C. H. Herty Jr., and J. E. Jacobs, in Metal Progress, February 1931, *p.* 93, 7 *pp.*, 6 *illusts.*

When a heat is ready to be ored it contains nonmetallic matter. It is partly cleaned by the ore but the addition of spiegel with the ore facilitates the removal of impurities. Material coming from the bottom of the furnace under investigation was picked up during the working period. High temperature will eliminate most of this by the boiling action in the furnace. Manganese-silicon alloy followed by a small manganese addition apparently eliminates any inclusions from this source, as well as normal products of deoxidation. Deoxidation with manganese-silicon alloy gives a much cleaner steel in the furnace than deoxidation by ferromanganese or ferrosilicon. Iron oxide content of acid open-hearth steel increases gradually as carbon is eliminated. Holding the steel in the ladle as long as possible is of direct benefit in eliminating nonmetallic matter.

—STEEL 2-19-31

Vapor-Seal Furnace

The development undertaken in an effort to produce gas-fired equipment capable of meeting both the increasing demand for the continuous heat treating furnace and that for the bright annealing of metal products, described by C. V. Smith, Industrial Gas, January 1931, *p.* 14, 2½ *pp.*, 2 *illusts.*

The furnace described embodies many features of practicability and economy in operation, and whereas an absolutely bright-annealed finish is not claimed by the designers, an enormous improvement accompanied by elimination of the pickling problem has resulted. No oxidation mars the finish, nor is the fuel consumption greater than formerly. The furnace is of the continuous-belt type, using a heavily saturated gas atmosphere. Door venting is provided to shut out air inlet, and a specially developed spray hood at the discharge end reduces the temperature of the work before quenching to eliminate scaling. The length of the heating area is 19 feet 9 inches, divided into two zones with a preheating chamber 7 feet 6 inches in length, and a soaking chamber of 11 feet 6 inches. Inspirator gas burners are used under two-zone control.

—STEEL 2-19-31

Overoxidized Steel

An investigation of the so-called over-reduced condition in molten steel, discussed by J. C. McCrae, R. L. Dowdell and Louis Jordan, in bureau of standards research paper No. 250, 26 *pp.*, 16 *illusts.*

A study was made of four heats of acid electric steel for castings in which two heats were in the so-called over-reduced state while the others were in the normal condition as made according to general practice. The two types were investigated as regards temperature of the molten metal, structure, and physical and chemical properties. The lower fluidity or runability of the overoxidized steel manifests itself in a short filming-over time with the melter's spoon test. This apparently is caused by the rapid formation of silica, which rises from the steel because of the addition of excess metallic silicon to an oxidized steel.

—STEEL 2-19-31

FABRICATION:

Inspection of Welds

Limitations outlining what can be accepted and what should be rejected in the welding of buildings, discussed by Franz Eder, in Journal of American Welding society, January 1931, *p.* 12, 2½ *pp.*

Quality of welding rods is of great importance. The inspector will have to satisfy himself that the rods supplied to the job conform to the requirements of the specifications, or at least to recognize good practice. Another important point in the inspection of welded structures is the necessity of having clean parent metal, where the welds are to be made. It is essential that the inspector on the job be supplied with definite proof that each and every welder has passed the qualification tests and specifications should stipulate this feature implicitly. Tolerances should be predetermined by the interested parties and should be included in instructions to the inspector.

—STEEL 2-19-31

USES:

Automobile Steels

Specifications and heat treatment of steel used in the construction of automobiles, discussed by J. M. Watson, in Metal Progress, February 1931, *p.* 33, 5 *pp.*, 5 *illusts.*

The past three years have seen the development of an alloy crankshaft that does not require any treatment other than normalizing after forging. Connecting rods usually are made of drop forging steel S. A. E. 1040. Piston pins always are carburized. High-carbon oil-quenched and carburized gears for the transmission are favored. Alloy steels have come into almost universal use for steering knuckles. Chief requirements of leaf springs, bolts and studs and deep-drawing stock are discussed.

—STEEL 2-19-31

MISCELLANEOUS:

Bearing Lubrication

Lubrication of ball and roller bearings in the steel mill, discussed by D. E. Batesole, in Iron and Steel Engineer, January 1931, *p.* 8, 5 *pp.*, 10 *illusts.*

In general it may be stated that the requirements for the lubrication of roller bearings do not differ materially from those required for ball bearings. The relative merits of grease and oil for lubrication purposes are cited by the author. Antifriction bearings if used with properly designed housings, and assuming no unusual temperature conditions, should not require lubrication more often than every three months. Various devices for sealing bearings and housings against oil leakage are described.

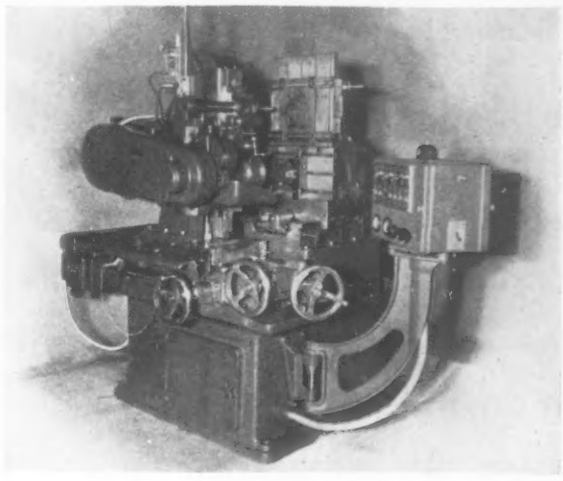
—STEEL 2-19-31

Machine Tools and Plant Equipment

«Without machine tools modern machinery could not be built.»
—Joseph W. Roe

Automatic Contour Miller Is for Toolroom Use

Keller Mechanical Engineering Corp., 70 Washington street, Brooklyn, N. Y., has developed two small die-cutting machines suitable for general toolroom use. These machines, one of which is shown in the accompanying illustration, operate from sheet metal templets under automatic electric control of extreme accuracy and sensitivity. They will rapidly and economically cut precision dies for blanking, piercing, extruding and progressive operations, as well as molds, cams, punches and any odd-shaped work which can be milled under guidance of templets. One of the new machines is for milling operations only, while the other has a built-in jig boring device which enables the operator to locate holes and to drill and bore them, all with extreme precision and at one setup.



Under guidance of templets, through medium of electrical control, this toolroom type automatic form milling machine accurately cuts dies, punches, molds and other irregular shapes

Ruggedness with Accuracy

The manufacturer points out that these machines are of unusually rugged construction in order to withstand heavy roughing cuts. At the same time the mechanism is sensitive enough to enable effective use to be made of milling cutters as small as 0.042-inch diameter. Regular spindle speeds range from 225 to 3500 revolutions per minute, and by means of a special spindle a speed of 10,000 revolutions per minute is possible.

The cutter spindle is guided by means of electrical control from a sensitive tracer which follows the outline of a templet. Aside from occasional manual manipulation of the tracer control ring to give the machine its directional bias, all contour milling operations go on automatically. The column slides on a horizontal bed and carries a vertical slide for up and down movement of the cutter head. Vertical and horizontal motions also can be manually controlled by switches or by handwheels.

The transverse traversing mechanism is in the work table and in the single-purpose machine is actuated by a handwheel. The machine with jig borer has power transverse feed, and also is equipped with built-in vernier scales, magnifier and reading lights. The standard cutter spindle is driven by a 1½-horsepower direct-current motor by V-belts on four-step pulleys. This gives four speeds on open belt, and in addition, four other speeds can be attained through back-gears which are controlled by a single lever. Coolant is delivered to the cutting point by a motor-driven pump.

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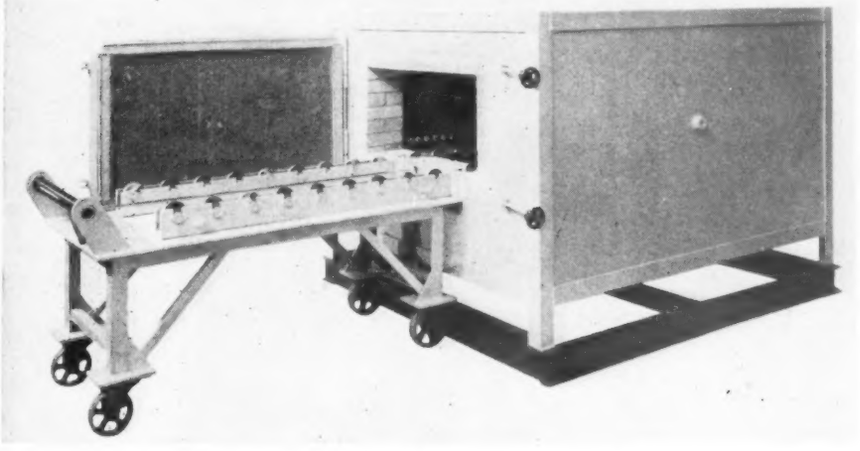


New line of special electrically heated furnaces of batch type gives unusual economy and operating convenience on production nitriding

Batch-Type Nitriding Units Are Heated Electrically

General Electric Co., Schenectady, N. Y., announces a complete line of batch-type nitriding furnaces for use at temperatures up to 1200 degrees Fahr. Included in the line are two sizes of vertical cylindrical-type furnaces with fans for circulating the ammonia gas, and two sizes of box-type furnaces, complete with charging trucks for handling the retorts.

The vertical-type furnace consists of an outer shell containing the heating units of nickel-chromium resistor ribbon and an inner retort which is inserted into the furnace through a hole in the cover. The retort is made in two parts, the upper part contain-

Tied Hands

NEW days mean new ideas. Parts must be constantly altered to meet new or unforeseen conditions. Assemblies must be frequently redesigned as requirements change. Even entire machines are not immune to sudden, drastic, new demands from the field. Under these conditions any method of manufacturing parts that requires huge and assuredly steady volumes to produce low costs can be very dangerous. For such a method ties a hard, tight knot about the hands responsible for new design; a knot that renders impossible the engineering necessary to keep a machine or piece of equipment at the forefront of its field, in design and resulting sales.

Untying Hands With Sivyer Parts

In this era of constant change, of new models and new lines, of specialized design and intense competition, Sivyer *Cast Steel Parts* untie the hands of designer, manufacturer and sales force.

For *Cast Steel Parts* give these things to light, small, complicated and thin section parts as well as heavier, simpler units:

(1) A simple, inexpensive pattern is the only investment required. A part, an assembly and even an entire machine can be changed more rapidly, more frequently and more inexpensively—to meet ever-changing field demands.

(2) The cost of adding and producing new lines, especially small production lines, is lowered. There is no high investment in dies or other producing equipment to charge off against a few units.

(3) The "bugs" that are constantly being brought to light by changing or unforeseen field conditions can be "licked" fast, before they damage reputation and sales.

(4) A wide range of alloys and heat treatments provides a flexibility of design to meet particular and hard field or manufacturing problems—and these alloys and heat treatments can be used on short productions without involving an excessive premium.

The place that Cast Steel Parts have gained in equipment and machinery manufacture is ably told by the story of what Cast Steel Parts are and do. That story you will find in the latest addition to the Sivyer Library: *Dependability in Steel Castings*. A copy may be had for the asking.

SIVYER
STEEL PARTS

SIVYER STEEL CASTING COMPANY · CHICAGO · MILWAUKEE

ing the motor and fan, and the lower part containing the charge to be nitrided. The fan is of the unidirectional high-pressure type which assures complete diffusion of the ammonia gas through the charge. The upper half of the retort is part of the cover and is heavily insulated to keep the motor at operating temperature and to keep the radiation losses at a minimum. The lower part of the retort is a special alloy-steel container completely welded gas tight. A basket is provided for the charge and is supported within the retort. A close fitting alloy steel hood covers the fan and fits down on the basket, thus guiding the circulation of gas through the charge.

Sealing of Retort

The two halves of the retort are joined securely together by means of bolts and nuts through metal rings attached to the outer circumference of each part. Gas leakage is prevented by means of a simple yet effective seal, consisting of an asbestos ring gasket compressed between the two rings. The inlet and outlet for the ammonia is through the cover, so that the complete retort can be withdrawn from the furnace at the end of the nitriding cycle, and allowed to cool outside the furnace. This furnace is available in two sizes; the smaller has loading dimensions of 14⅝ inches diameter by 18 inches depth; the larger has loading dimensions of 20½ inches diameter by 26 inches depth.

Space Economy

The box-type furnace, shown in an illustration on Page 55, is small and compact, requiring little head room and comparatively little floor space. Light weight refractory brick is used in the furnace and a simple swing-type door with screw clamps and an asbestos gasket to prevent heat leakage is provided. A rack and roller track is attached to the floor of the furnace to assure ready insertion and removal of the alloy steel retort used to hold the charge. The cover of the retort is provided with a down-turned lip which engages in a groove provided around the top of the retort itself. The sealing medium for the retort is an asbestos and aluminum gasket compressed between the lip and groove by heavy bolts and nuts around the perimeter of the retort. Inlet and outlet tubes for the gas are of pure nickel tubing extending through cone-shaped bushings in the back of the furnace.

The furnace is available in two sizes; the larger having retort dimensions of 28 inches wide by 48 inches long by 11 inches high; the smaller having retort dimensions of 19½ inches wide by 48 inches long by 11 inches high.

Because of the long holding cycles of the nitriding process where only the radiation losses of the furnace plus the small amount of heat required to raise the temperature of the ammonia gas need be supplied, it is advisable to cut down the input to the furnace after the charge is up to temperature. Therefore the control panels of these nitriding furnaces are provided with switches by means of which the input may be reduced to one-third of the rated value.

This sawing machine cuts off light metal sections rapidly and neatly

◆

Welded Steel Bulldozer Is Designed for Strength

Steelweld Machinery Co., Cleveland, announces a new line of bulldozers fabricated from steel plates and shapes by welding. The accompanying photograph clearly indicates the clean lines and rugged strength which have been attained through this method of construction.

Heavy rolled steel members form the die-holding base, these being carried back to the steel-jacketed main bearings. These members carry hardened and ground steel bearing plates on which the ram slides. Not only do these steel plates insure long life, but also they do not become nicked by hard scale nor damaged by wrenches and other heavy objects often accidentally dropped upon them.

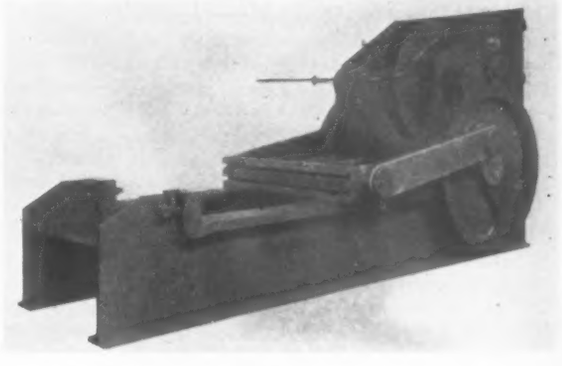
All gearing is of steel with cut teeth, and the driving mechanism, including the motor, is enclosed completely within the main frame of the machine, drive being by silent chain. The under-gibbing for the ram has a single take-up so designed that it will not catch dirt and chips. The flywheel and also the high-speed shaft are mounted on tapered roller bearings. Side-arms are of steel, and, like the main bearings, are bronze bushed. A solid shaft which is welded into the steel ram eliminates trouble from broken end lugs. The face of the ram is a heavy steel plate in which practically unbreakable T-slots are machined.

The manufacturer guarantees the frame of the machine to be unbreakable when used with the motor recommended. The main clutch is of the twin-disk type and one-shot lubrication is provided for all bearings. Reversing clutches are standard in the larger sizes. Electrical clutch control, optional on all the machines, is recommended as a timesaver on production work.

◆

Metal-Cutting Saws Insure Fast and Smooth Cuts

Hunter Saw & Machine Co., Pittsburgh, has developed a line of swing-frame circular saws for the rapid and smooth cutting off of light metal sections, tubing, shapes, etc. These machines are built in three types; one for cutting steel, another for cutting brass and copper, and a third for cutting aluminum. They are identical, with the exception of drive motors, coolant pump equipment and



Fabrication from steel plates and shapes by welding, results in a bulldozer which is claimed to be unbreakable under any ordinary service conditions

New line of lifting machines requires minimum power for operation

peripheral speed of the saws. The illustration on Page 59 gives an idea of the design and operating mechanism of these machines.

The saw table, surrounded by a cast ledge for catching the coolant, has four machined T-slots running its entire length, these being designed to hold quick-acting vise jaws which can be adjusted for angular as well as straight cuts. Motor and saw arbor are mounted on opposite ends of a balanced swing-frame, the saw arbor being driven direct from the motor through multiple V-belts.

General Specifications

The machine designed for cutting steel is equipped with a 5-horsepower motor and an 18-inch saw, while the machines for cutting brass, copper, and aluminum are equipped with 3-horsepower drive motors and 14-inch diameter saws, and also have auxiliary motors of ⅛-horsepower which drive coolant pumps mounted on self-contained reservoirs below the saw tables. This pump equipment is unnecessary when cutting steel. Any of the machines will accommodate saws ranging in diameter from 10 to 18 inches.

The saw blade is pulled through the material by an off-side hand lever, the cut requiring only a few seconds. Saw blades and belts are adequately protected by steel guards which conform to safety specifications. Chips are caught in a drawer-type chip pan hung below the saw table in such a manner that it can be withdrawn easily for emptying.

Inserted Tooth Metal Saws Provide Draw Cutting

Henry Disston & Sons Ins., Philadelphia, has brought out a new line of inserted-tooth metal-cutting saws designed for draw-cutting. Interlocked teeth are set at an angle to bring the cutting edges on radial lines so that the teeth are pulled through the metal instead of being pushed throught it. This new principle of saw design is the result of numerous experiments, and is said to result in unusually smooth cutting at high speeds.

According to the maker, long, hard tests prove that when these teeth hit either hard or soft spots, there is no tendency for them to "hog in," that is to dig into the work. Rather, they relieve themselves and continue cutting smoothly. These new saws, which are designed for general work, have been found to be particularly efficient in cutting large rounds and sections. They are being produced in all common diameters with various tooth spacings to meet ordinary requirements for saws with individually inserted teeth.

◆

New Lifting Machines Are Ball Bearing Equipped

Economy Engineering Co., 2653 West Van Buren street, Chicago, has put on the market a new line of ball bearing equipped lifting machines, one of which appears in the accompanying illustration. The line includes both hand and power operated types of both plain and telescoping machines.

In all models, ball bearings are used throughout in connection with the gearing, sheave, and platform frame wheels. On the telescoping types, the sliding frame wheels also are so equipped. Friction is further reduced by means of flangeless guide wheels which are used to support the platform and telescoping frames. An actual increase of 25 per cent in efficiency is claimed as a result of these innovations, only 25 pounds cranking pressure being required to lift the rated load on the hand type, while in the electric models, proportionately faster travel of the platform results.

Spur geared hoisting units are used exclusively, those of the hand power types being fully guarded and grease lubricated. The electric units are contained in metal cases and run in oil baths. The hand-type machines have self-acting gravity brakes while the electric types have dual braking systems, both brakes working automatically to hold the load wherever desired and to effectively prevent falling of the platform in case of current failure. The electric-type machines are equipped with high-torque motors of ½, 1, 2, and 3 horsepower, or greater horsepower in special cases where extra speed of operation is desired.

Unless otherwise specified, all the electric models are controlled by means of a single lever drum switch. A lever attached to the rear of the controller shaft operates the service brake, thereby insuring prompt application at all time. Automatic limit stops prevent overtravel of platform, by returning the control lever to "stop" position, thereby stopping the motor and setting the brake. Pressure greasing systems are used on guide, sheave and base wheels of all models, as well as on the hand power hoisting unit. To augment visibility insuring quick finding in large plants or dimly lighted warehouses, these machines are finished in aluminum with red and black trimmings.

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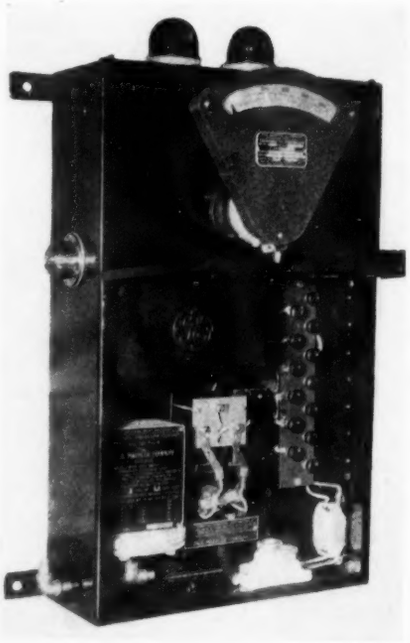
Automatic Oven Control Is Effective Safety Device

Paul Maehler Co., 2208-20 West Lake street, Chicago, recently has put on the market an automatic temperature and safety control for industrial ovens. The accompanying illustration shows this instrument with



Automatic control for industrial ovens provided by electrical devices

the cover lifted to reveal its operating mechanism.

The cabinet is 20 x 10 x 5 inches, and its lid can be locked. It can be installed at any convenient place adjacent to the heating equipment which it controls. Various devices within and on the cabinet include main switch fuses, temperature control valve, automatic mercury actuator, gas pressure controller, high voltage transformer, time delay control, and red and green flasher lights which give signals indicating operation of the mechanism. Regular 110-volt current enters through a snap switch mounted on the cabinet.

Mode of Operation

On the outside of the cabinet is an indicating controller which may be set for any desired temperature. Adjustable arms provide maximum and minimum range. When contact is made with the temperature indicating arm, the electrically operated temperature control valve closes or opens automatically as the case may be, thus retarding or increasing the fuel supply to the oven, thereby maintaining oven temperature within desired range. One of this company's automatic shutoff safety valves is located on the heater itself to shut off the fuel supply in the event of either fan or fuel failure. When once closed, this automatic valve cannot be turned on except by manual operation, and in addition, an automatic time delay control in the cabinet prevents further flow of fuel until a certain predetermined time has elapsed.

The mercury actuator in the cabinet operates a spark plug providing intermittent sparking at the pilot light. Thus, should the pilot light go out, it instantly is relighted. This action is indicated by the red flasher.

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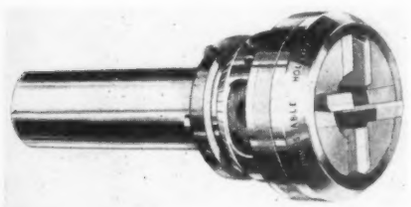

Tools with adjustable interchangeable blades are adaptable to many uses

Adjustable Hollow Mill Is Tool of Many Uses

Gairing Tool Co., Detroit, has developed a new line of adjustable inserted blade hollow mills. The accompanying illustration shows not only the external appearance of one of the tools, but also reveals construction of the blades, and of their adjusting and retaining mechanism. These mills are designed to perform both roughing and finishing operations on bar stock, castings and forgings, the maker characterizing them as combination tools for hollow milling and facing.

Blade adjustment is by simply rotating a cone shaped external nut, which has direct bearing on the outer edges of the blades, and which is graduated in thousandths of an inch to show amount of adjustment. A positive lock secures the blades firmly in the body and tilting is impossible even under maximum cuts. The blades are interchangeable, and the bodies of the tools are case hardened to insure long life.

The standard line comprises eight sizes, ranging in diameter capacity from ⅛ to 2 inches, Morse taper or straight shanks being optional. Special sizes for work of any reasonable diameter, requiring various numbers of blades, also special bodies provided with drills, reamers, multiple-operation cutters, pilots for facing and spotting, etc. can be supplied on order.

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Portable-type filing tool gives speed with operating convenience

Air-Operated Filing Tool Is Useful on Die Work

Madison - Kipp Corp., Madison, Wis., announces an air-driven filer capable of giving from 500 to 5000 ¼-inch strokes per minute, speed being controlled by a trigger valve conveniently located on the pistol grip. The accompanying illustration shows this machine with a file in place. This tool is similar to the air-driven chipper described on Page 52 of the January 8 issue of STEEL. Special files are held in a hand-operated collet at the end of the spindle, many different shapes and sizes of files being available to suit various kinds of work.

The tool is driven by an ingenious air motor of the turbine-rotary-valve piston type. Air, under pressure of 30 to 100 pounds per inch, enters the tool through a hose connected to the end of the pistol grip, and by the trigger valve is admitted to a rotary valve die cast into the turbine unit. The position of this valve always is such that the air flows either to one end or the other of the piston cylinder, driving the piston forward or backward, as the case may be, throughout half a cycle. This movement uncovers an exhaust port connected to the nozzles of the air turbine and from that point on the exhaust air from the piston motor drives the air turbine which in turn rotates the rotary valve, thereby directing air first to one side of the piston and then to the other. The piston is air cushioned, and violent vibration common to many reciprocating pneumatic tools is overcome.

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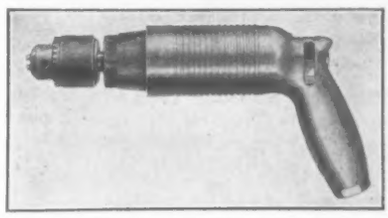

Light weight pneumatic drill has motor of unusual simplicity

Light Air-Operated Drill Has Simple Motor

Chicago Pneumatic Tool Co., 6 East Forty-fourth street, New York, announces a new tool which is claimed to be the lightest weight ¼-inch portable drill of the production variety ever put on the market. The accompanying illustration shows the compact design of this pneumatic tool and indicates the way in which it has been made to fit the hand. The maker recommends this new tool for drilling "tell tale" holes, for use on aircraft work and other light metal construction such as metal casements, and metal furniture.

The motor is designed to have extremely low air consumption and its simple character and few parts reduce maintenance cost. It has no pistons, no connecting rods, no crankshaft, no valves, no bushings, no eccentric and no eccentric straps. All bolts, nuts and screws also have been eliminated from the motor assembly by providing a threaded flange which holds motor and gear case together. The spindle is in the center of the housing, which permits "line drive." Throttle parts are rustproof to avoid possibility of sticking.

The tool has an overall length of 9⅛ inches, and spindle offset of 1 inch. Its operating speed is 2500 revolutions per minute and net weight is 3½ pounds. It comes equipped with a ¼-inch chuck, 8 feet of 5/16-inch hose and two hose nipples.

Here and There in Industry

(*Concluded from Page* 24)

the business always has remained in the hands of the Adams family. Mrs. Sprenger is a granddaughter of Sanford Adams Sr., one of the founders. Mrs. Elizabeth Adams, who now takes up the president's duties at the age of 73, is the widow of Henry V. Adams, who died in 1917.

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Donner-Hanna Coke Corp., Buffalo, has just completed a battery of 51 coke ovens at its Buffalo, plant. Coke production is increased 30 per cent.

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American Sheet & Tin Plate Co. and the Carnegie Steel Co. have opened offices in the Atlas building, 8 East Long street, Columbus, O.

□ □ □

Trenton Emblem Co., 120 Hamilton avenue, Trenton, N. J., has been bought by the Edgely Brass Co., Edgely, Pa.

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Wellington-Stone Co., 460 West Superior street, Chicago, has purchased the Aladdin Mfg. Co., Muncie, Ind., manufacturer of electric portable lamps.

□ □ □

Newton Steel Co., Youngstown, O., has moved its Chicago sales offices from 122 South Michigan avenue to suite 724, Straus building, 310 South Michigan avenue.

□ □ □

Worthington Pump & Machinery Corp., Harrison, N. J., has moved its St. Louis district sales office to 1703 Ambassador building, 411 North Seventh street.

□ □ □

Neff, Kohlbusch & Bissell Inc., machine tools and automatic and special cost-reducing machinery, has established itself in larger quarters at 2400 West Madison street, Chicago.

□ □ □

Signal Aluminum Co., H and Twenty-eighth streets, Chattanooga, Tenn., has changed its name to Watson Aluminum Co. and will add brass and bronze castings to its products.

□ □ □

Round California Chain Corp., Ltd., South San Francisco, Calif., has been established as an associate of David Round & Son, Bridgeport Chain & Mfg. Co., Cleveland Chain & Mfg. Co., Kren Chain Co. and the Seattle Chain & Mfg. Co. to serve western trade.

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Grasselli Chemical Co. Inc., Cleveland, is putting on the market a new product, an inhibitor for use in pickling solutions to prevent over-pickling and to curtail loss of metal and thus save acid. Two grades are being made, foaming and nonfoaming.

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Western Machine Tool Works, Holland, Mich., announces it has bought the business of the Chard Lathe Co., Newcastle, Ind., manufacturer of lathes. Manufacture of lathes from 16 to 28 inches will be continued at the Holland plant.

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McInnes Steel Co., Corry, Pa., has been organized as an outgrowth of the McInnes Steel Co. Ltd. A charter will be obtained, the temporary board of directors including F. E. Whittlesey, Harry B. Smith, Colin McInnes, E. J. Lewis and A. G. Postlethwait.

□ □ □

Eagle Iron & Brass Foundry, Monroe and Second streets, Passaic, N. J., has been merged with William P. Laytham Sons Inc., 899 Market street, Paterson, N. J. Both companies were owned by Mr. Laytham and his sons. The Passaic plant has been closed.

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Doelger & Kirsten, Milwaukee, manufacturer of alligator shears, has been incorporated as Doelger & Kirsten Inc., the partnership of Oscar Kirsten and William C. Kirsten, who remain principal owners, and Charles H. Doelger, who died in 1929, being merged into the corporation.

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Capital Steel Co., Little Rock, Ark., has been formed by Victor C. Anderson and Werner C. Knoop, formerly with Capitol Steel & Iron Co., Oklahoma City, Okla. It will engage in the sale of steel for buildings and highways.

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Illinois Testing Laboratories Inc., 141 West Austin avenue, Chicago, has appointed Porter Hurd, 516 Packard building, Philadelphia its representative in eastern Pennsylvania, southern New Jersey, Delaware and Maryland for its line of pyrometers, resistance thermometers and other instruments for industiral measuring purposes.

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Ohio Iron Works Co., Cleveland, which recently expanded its plant, has added a department for designing, manufacturing and installing material handling equipment. Hermon Swingley and G. A. Parker, both of long experience in this class of design and production, have been added to the company's personnel.

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Pacific Gas & Electric Co. has installed at its Newark, Calif., substation the first 60-kilovolt cable on the Pacific coast or west of Chicago. It consists of one circuit of three cables and a spare cable, each 350 feet long, passing under the substation. Its purpose is to avoid carrying the heavy voltage over the station.

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Mechanics Universal Joint Co., Rockford, Ill., a division of Borg-Warner Corp., Chicago, has closed a contract for universal joints with one of the larger European automotive manufacturers, it is announced by C. S. Davis, president of Borg-Warner Corp. Shipments this month on the order will amount to 5000 universal joints. Total shipments for the year are expected to be about 35,000 units.

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Advance Rumely Corp., La Porte, Ind., has been formed by merger of the Advance Rumely Co. and the Indiana Farm Machinery Corp., La Porte, Ind. Formal approval to the consolidation has been given by the directors of both companies. The newly formed corporation is to have an authorized capital stock of 500,000 shares of no par common, of which 277,500 will be exchanged for the preferred and common stock of the present Advance Rumely Co.

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Highway Trailer Co., Edgerton, Wis., which recently acquired the entire property of the Martin Trailer Co., Westfield, Mass., from the receiver, will reorganize the concern as the Martin Rocking Fifth Wheel & Trailer Co. and reinstitute it in the Eastern market. The Martin company owns nine basic patents in the semi-trailer industry. Under the new ownership it will make a full line of semi and full automatic trailers in capacities from 3 to 20 tons. James W. Menhall is president.

□ □ □

United Dry Docks Inc., 11 Broadway, New York, has acquired exclusive rights on the Atlantic coast to the Kjekstad patented truss-weld and reverse channel system of ship, barge and tank construction. J. Kjekstad, inventor of the two systems and former president of the Truss-Weld Barge Co., has joined the truss-weld division of the Dry Docks company as consulting engineer. A. Hudson, formerly vice president and sales manager of the barge company is sales manager of the division.

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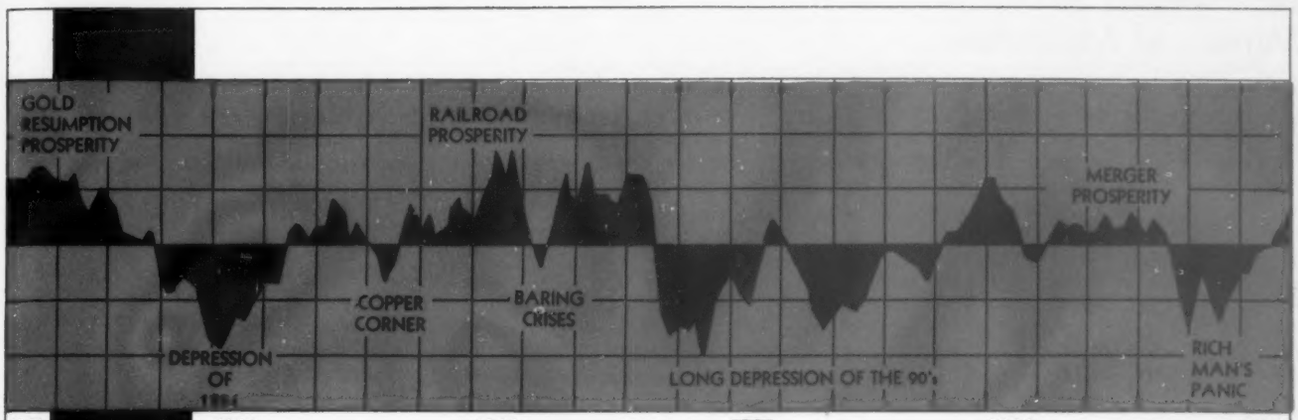
Oilgear Co., Milwaukee, has booked two orders valued at $60,000 for variable speed driving equipment. One is from the navy department, Washington, for hydraulic drive equipment for launching and retracting catapaults for airship carriers. The other is from the Eastman Kodak Co., Rochester, N. Y., for variable speed driving equipment for a paper-making machine, of 10 individual sections, each driven independently at its proportionate speed to allow for shrinkage of the paper as it travels from the wet end of the machine to the finished end.



Study of the Past Builds Confidence in the Future

DURING the past fifty years the United States has seen fifteen periods of depression. Fourteen of them were followed by periods of prosperity. Judge for yourself what will follow the fifteenth, taking into consideration the fact that there never has been a time when people's needs were so many and so diversified as now. That is why manufacturers today everywhere are getting ready to meet the demands they know are on the way, demands for old products made better, made more economically and new products to replace the old.

The Witherow Die Rolling Process is a challenge for existence to every plant now using old style, obsolete methods for the manufacture of duplicate metal parts in enormous quantities—parts that need to have greater tensile strength, greater compressive resistance and greater torsional endurance than similar parts made by previous methods.

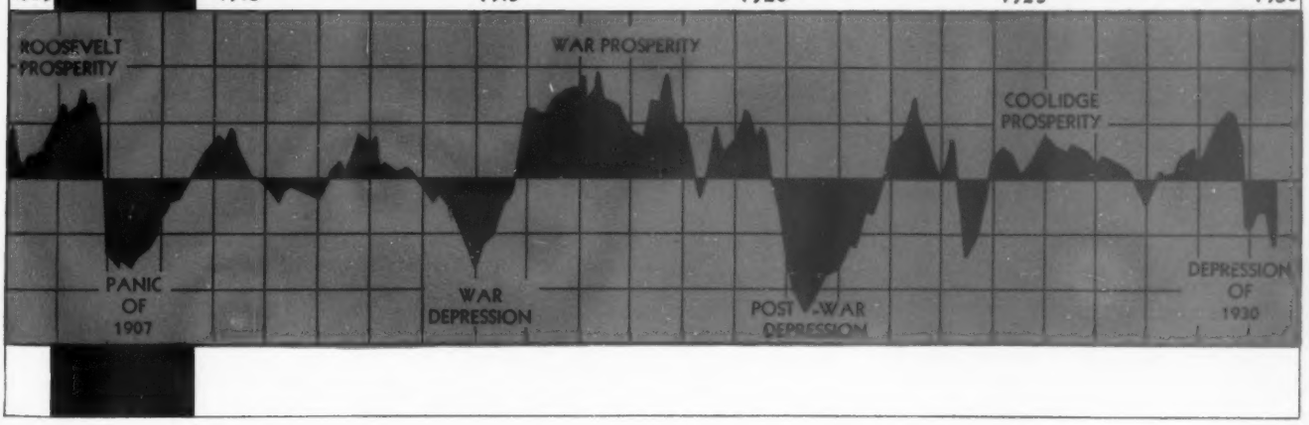
Millions of axles, transmission shafts, wheel spokes and other automobile parts, horseshoes, wagon axles, track tie rods and similar articles have been made by the Witherow Die Rolling Process. Let us give you details.

WITHEROW DIE ROLLING DIVISION

GENERAL SALES OFFICE: BUFFALO, N. Y., BOX 1000

REPUBLIC STEEL CORPORATION

GENERAL OFFICES YOUNGSTOWN, OHIO



Mirrors of Motordom

(*Concluded from Page 25*)

and is being delayed in assembly by failure to synchronize motor and body production. More motors have been made, especially for the new 16, than there are bodies in which to put them.

Cadillac-LaSalle has tapered slightly. Ninety cars are being made daily, evenly divided in thirds among Cadillac 8, 12 and LaSalle 8 production. For the Cadillac 16, only two are being made daily.

Lincoln is constant at 25 to 30 units daily, 5 days.

Reo makes 45 to 50 models a day, also 5 days, and has a February schedule calling for approximately the same monthly total as January.

Significant in scanning the above list are the steps ahead in output by several, constancy for the rest, and an absence of schedule curtailment.

Stainless Steel Coatings Being Applied Like Veneer

So-called stainless steel is coming into a new application. Experiments are being worked out to impregnate ordinary carbon slabs and billets with a coating of 18-8 metal. Basically, the operation is similar to the copper-coating of wire or sheets.

While hot in the mold, the carbon steel ingot would have 18-8 metal poured around it. To the eye, the corrosion-resistant qualities and appearance would be engrafted on the lower-priced carbon billet. It is claimed that this billet can be rolled into the desired form with its veneer remaining intact.

At present this experiment is being prosecuted with an eye to using the material for brake drums and bumpers.

Budd is circularizing the automobile owner with the advantages of its so-called stainless steel, steel veneer snap-on spokes. Motor Rim and Kelsey Hayes also are manufacturing these snap-on spokes.

Cadillac is putting solid so-called stainless steel spokes on its 16-cylinder model for $150 extra. Reo, Pierce Arrow and Lincoln have experimented with the idea, but the cost was found too high.

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Space for an ever-enlarging gasoline tank has been a problem of the automobile designing engineer.

Gasoline tanks' increased capacity will answer the needs in emergency driving, long-distance touring or touring with a "pet" brand of gasoline, perhaps night driving. Terne plate, used almost exclusively in gasoline tank fabrication, runs into a sizable tonnage yearly.

Long ternes are the product mostly used, with a coating of lead and tin which runs from an 8 to 15-pound coating per 100 square feet of steel.

Ford, with a 10-gallon capacity tank, uses No. 18 gage long ternes, 15-pound lead and tin coating, weighing 1½ pounds to the square foot. The tank is a weld of two parts, fitted as part of the cowl and attached to the dash board. For the Ford size tank an approximate 5 to 6 pounds of terne is used. Ford has also been using autobody sheets with the above coating for some tank work.

Even in the depressed year of 1930, when some million and a half Fords were produced, the tonnage of long terne would run close to 7,500,000 pounds, not counting scrap loss, for gas tanks for this one maker alone.

Cadillac likewise uses a No. 18 gage plate; Hupmobile employs No. 19 gage, extra deep drawing quality. All other makers use No. 20 gage terne material, and with the exception of Ford, all others have tanks fabricated from a single piece.

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Although a financial house has circulated the rumor that the expected Ford 8 will be called the Edison, logic is on the side of utilizing the name Ford. No name in the automotive world is so well publicized as Ford, and there is no inhibition on the use of the name for more than one model.

Cadillac shares its name on an 8, 12 and 16-cylinder line. Dodge blankets an 8 and a 6; so do DeSoto, Hupp, Studebaker, Nash, Auburn—in fact, most of the more prominent makers. So, it is believed, a Ford 4 and a Ford 8 would not be exhausting the possibilities of the greatest name in motordom.

Great Lakes Steel Corp. Increasing Its Production

In line with gaining auto operations, Great Lakes Steel Corp, runs all four open hearths at Ecorse, after some doubt a fortnight back as to whether more than three would be kept pouring.

Now it is believed that before another month is out all available six of the company's battery of 150-ton capacity furnaces will be on.

The company, though now rated at a 450,000 to 500,000 tons of steel ingots annually, has ambitious plans, though not as yet in any active state, to increase capacity to 1,000,000 tons. Thus far each furnace has run on an average output of 176 tons since ingot operations were started last August.

Talk of Newton Steel Co. opening its Monroe, Mich., plant shortly is not generally credited. Likewise has rumor been officially and emphatically spiked from Canadian Steel Corp. headquarters across the river in Canada to the effect that the latter was going to enlarge its wire and tin plate plant, possibly reconstruct its two half-completed blast furnaces.

Highland Park Offers Ford Inducements To Return

The municipality of Highland Park has offered Henry Ford free taxes for 5 years if he returns to his former scene of activity. Evidence becomes certain of increased lots of machinery being shipped into the Highland Park plant, supposedly for the manufacture of the Ford 8. Says *Crams Automotive Reports:*

"New machinery is being installed in the Highland Park plant of the Ford Motor Co., following the recent movement to the Rouge factory of certain manufacturing operations pertaining to Model T and Model A miscellaneous parts which have been produced at this plant.

"We have positive information to this effect and while the exact nature of the machinery is not clearly known to us, it has no connection with that which is being removed and therefore we regard this as further confirmation that the Highland Park plant will be the scene of activity on the 8-cylinder car to be produced by Ford.

"The question has come up as to whether the Model A will be retained in view of an introduction of an 8-cylinder car. In our opinion the present Model A will be retained for its commercial value and the continuance of sales possibilities in the low-priced field.

"Evidence of this is to be found in the recent list price reduction, affecting the entire line. Such a cut, we believe, was made not only for the immediate purpose of stimulating sales against low-priced competition, but also with the more distant view of placing sales conditions in a more favorable situation when the new car is introduced."

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Graham has brought out syncromesh transmissions. . . Mercer Motor Car Co., after an absence from production since 1922, will bring out an eight next fall. . . Hudson-Essex is reorganizing personnel again, this time replacing several men with former Studebaker employes. . . Cadillac on its 12 and 16 has incorporated cast iron brake drums, as predicted some time ago in these columns; Lincoln is the next to be considering it. . . Several trucks have been using cast iron brake drums for some time before the Cadillac. Ford, in attempting to solve the automotive world's brake problem of scoring and squeaks, considered cold-rolled strip for brakes at one time last fall but gave up the idea due largely to the additional expense involved. . . Ford has extended to strip makers the cubic-inch tolerance on weight so rigidly demanded on sheets.

Demand Again Expands Steel Rate

Operations Reach 52-53 Per Cent, with 65 Forecast for June—Trend May Lead to Higher Steel Prices—Pig Iron and Coke Off at Pittsburgh—Scrap Weaker

SENSITIVE to a moderate but well-distributed expansion in demand, steelworks operations have advanced two to three points, to between 52 and 53 per cent this week. This is the eighth consecutive weekly increase and puts the current rate 45 per cent above that of the first week of January.

Birmingham mills have stepped up seven points to 65 per cent, and Buffalo five to 59. Chicago at 48-50 per cent, Pittsburgh at 47 and eastern Pennsylvania at 51-52, all are up two points. Youngstown is unchanged at 50 per cent, though indicating a gain next week, while Cleveland is off three points to 50.

Portending further improvement, the Jones & Laughlin Steel Corp. and Illinois Steel Co. each are putting on a blast furnace stack this week. A usually well-informed steel executive estimates production will reach 65 per cent by June. Last year, operations rose from 70 per cent in January to 85 in February, then fell to 65 by June.

These small but maintained weekly gains in steelmaking, apparently based upon increased consumption, may be decisive in determining second quarter prices. If this trend is maintained over the next few weeks, and there is every indication that it will, then producers may logically be expected to seek more remunerative prices.

Excepting structural material and steel pipe, bookings of all finished steel products show an increase this week, and in the case of structurals fresh inquiry and maturing pending work insure this is temporary. Rains in the drought-stricken areas of the Middle West have greatly lightened sentiment and precipitated better jobber buying of wire products.

By industries, the balance is well maintained. Automotive consumers of steel are issuing better releases and seeking prompt shipment. Railroads are laggards in the equipment market but have speeded up their takings of track material, some lines which have not bought this year specifying against their 1930 carryover.

Action is expected next week on 1200 hopper cars for Bessemer & Lake Erie railroad, which will leave 650 freight cars on inquiry. Parts for 1000 cars have been bought by the Missouri Pacific. Nickel Plate, which is inquiring for 10 locomotives, may allocate 27,400 tons of rails this week.

Thirty thousand tons of steel pipe will be required for a gas line in Nebraska and Wyoming which the North Central Gas Co. will lay. On 1800 tons of cast iron pipe Detroit has rejected the low French bid and bought domestic pipe.

At Chicago fully 25,000 tons of structural work is pending, including 10,000 tons for the new Inland Steel Co. mill. Highway work leads in the East, Jersey City alone taking bids March 2 on a viaduct requiring 21,500 tons. Structural awards this week at 8936 tons compare with 21,525 tons last week and 34,405 tons a year ago.

Raw materials have developed a spotty market this week coincident with slacker demand, which is in contrast to the moderately-better situation in finished steel. While some price weakness has developed, it has been localized and represents more a delayed adjustment.

All pig iron grades at Pittsburgh and in the Mahoning are quotable at a range of 50 cents downward, foundry and basic iron now being $16.50 to $17, base, valley, and malleable and bessemer $17 to $17.50. In the lake district pig iron sales are lighter but shipments heavier. At both Chicago and Cleveland some small sales of pig iron for second quarter delivery have been made at current prices.

Distress furnace coke has sold off 10 cents at Pittsburgh, to $2.40. Scrap is definitely weaker at Chicago, heavy melting steel being down 25 cents to $9.75 to $10.25, the lowest since 1921. In most districts scrap tends this week toward softness.

Weakness in pig iron prices at Pittsburgh and in the Mahoning valley, manifest for some time but only now becoming quotable, has lowered STEEL'S market composite 8 cents this week, to $31.61, a new alltime low.

Composite Market Averages

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe.

This week (Feb. 18, 1931)	**$31.61**
Last week (Feb. 11, 1931)	**31.69**
One month ago (January, 1931)	**31.71**
Three months ago (November, 1930)	**31.92**
One year ago (February, 1930)	**35.24**
Ten years ago (February, 1921)	**48.81**

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Feb. 18, 1931	Jan. 1931	Nov. 1930	Feb. 1930
PIG IRON				
Bessemer, del. Pittsburgh	$18.26	18.76	18.76	20.76
Basic, valley	16.50	17.00	17.00	18.50
Basic, eastern del. eastern Pa.	17.50	17.25	17.50	19.00
No. 2 foundry, del. Pittsburgh	17.76	18.26	18.26	19.76
No. 2 foundry, Chicago	17.50	17.50	17.50	20.00
*Southern No. 2, Birmingham	13.00	14.00	14.00	15.00
**No. 2X, Virginia furnace	18.25	18.25	18.25	18.25
**No. 2X, Eastern del., Phila.	18.26	18.26	19.26	21.26
Malleable, valley	17.00	17.50	17.50	19.00
Malleable, Chicago	17.50	17.50	17.50	20.00
Lake Superior, charcoal, del. Chi.	27.04	27.04	27.04	27.04
Gray forge, del. Pittsburgh	17.13	17.63	17.63	19.13
Ferromanganese, del. Pittsburgh	89.79	89.79	103.79	104.04

*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $12 to $13, Birmingham. **2.25 to 2.75 silicon.

COKE				
Connellsville furnace, ovens	2.50	2.50	2.55	2.60
Connellsville foundry, ovens	3.25	3.30	3.50	3.50
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngs.	30.00	30.00	31.00	33.00
Sheet bars, open-hearth, Pitts.	30.00	30.00	31.00	33.00
Billets, open-hearth, Pittsburgh	30.00	30.00	31.00	33.00
Wire rods, Pittsburgh	35.00	35.00	36.00	40.00

	Feb. 18, 1931	Jan. 1931	Nov. 1930	Feb. 1930
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.65	1.65	1.60	1.85
Steel bars, Chicago	1.70	1.70	1.70	1.95
Steel bars, Philadelphia	1.94	1.94	1.89	2.17
Iron bars, Chicago	1.75	1.70	1.70	1.95
Shapes, Pittsburgh	1.60	1.60	1.60	1.85
Shapes, Philadelphia	1.81	1.81	1.71	1.86
Shapes, Chicago	1.70	1.70	1.70	1.95
Tank plates, Pittsburgh	1.65	1.65	1.60	1.85
Tank plates, Philadelphia	1.80½	1.81½	1.81½	2.00
Tank plates, Chicago	1.70	1.70	1.70	1.95
Sheets, blue anl., No. 13, Pitts.	2.05	2.05	2.05	2.35
Sheets, black, No. 24, Pitts.	2.35	2.35	2.35	2.65
Sheets, gal., No. 24, Pittsburgh	2.90	2.90	2.95	3.30
Sheets, black, No. 24, Chicago	2.50	2.50	2.55	2.80
Sheets, blue anl., No. 13, Chicago	2.20	2.20	2.30	2.50
Sheets, galvanized, No. 24, Chi.	3.05	3.05	3.15	3.45
Plain wire, Pittsburgh	2.20	2.20	2.30	2.40
Wire nails, Pittsburgh	1.90	1.90	1.90	2.30
Tin plate, per base box, Pitts.	5.00	5.00	5.00	5.25
SCRAP				
Heavy melting steel, Pitts.	12.75	13.00	13.10	16.90
Heavy melting steel, eastern Pa.	10.50	10.50	11.50	14.50
Heavy melting steel, Chicago	9.75	10.00	10.20	13.25
No. 1 wrought, eastern Pa.	13.00	13.25	13.50	15.25
No. 1 wrought, Chicago	9.00	9.50	10.00	13.70
Rails for rolling, Chicago	12.00	13.00	13.10	14.80

Sheets

Market Is More Active—Volume Heavier from Diversified List—Operations Better

SHEET PRICES, PAGE 71

Pittsburgh—Sheet business is moderately improved while production generally holds to its recent restricted rate of slightly below 40 per cent. Better operations are in prospect, however, with orders in heavier volume from a diversified list of buyers. Recent business for some producers is described as the best so far this year. Second quarter inquiry is light and intimations of price changes for that period are lacking. The market remains 2.35c, Pittsburgh, for common black sheets, 2.90c for galvanized, 2.05c for No. 13 blue annealed, 1.90c for Nos. 9 and 10 blue annealed, and 3.30c for autobody. Practically all recent orders are for rush shipment. Automotive buying remains spotty but is slightly heavier.

New York—A stronger tone prevails in galvanized sheets, which now appear to be holding at a minimum of 2.90c, Pittsburgh. This follows better demand, reviving talk in some quarters of a 3.00c, Pittsburgh, minimum as a possible development within the next few weeks. Black sheets are firm at 2.35c, Pittsburgh; blue annealed, 1.90c and 2.05c, Pittsburgh.

Philadelphia — Sheet business is slightly better. Prices are unchanged although sellers are forced to give extra good service. Galvanized sheets are firm at 2.90c, base, Pittsburgh. Other prices are steady.

Buffalo — Sheet production here has increased to about 50 per cent, compared with January ranges of 40 to 45 per cent. Producers look for a gradual improvement.

Youngstown, O.—An increase in the volume of new sheet orders has put on the active list two plants at Niles, O., this week that were idle last week, the Falcon works of Empire Steel Corp., and Mahoning Valley Steel Co. On the other hand, the Sharon Steel Hoop Co. and Republic Steel Corp. have each reduced the number of their active units by two. This irregularity in operations is not reflected in the case of full-finished makers. Demand for autobody sheets keeps valley makers of this grade busy and also fairly well booked. Quotations continue steady on autobody sheets at 3.30c, Pittsburgh, and furniture sheets at 3.60c. Common black are holding at 2.35c, and blue annealed at 1.90c to 2.05c, while galvanized ranges from 2.90c to 3.00c. So far the recent recession in the price of tin mill black sheets has not affected other grades.

Cleveland—Stove and electric refrigerator manufacturers are giving the market its chief support. Furniture makers are increasingly inactive. Thus far in February barrel makers have not improved upon their poor January business. Prices are fairly firm with nothing heard below 2.35c, Pittsburgh, on black sheets. The local Fisher body plant is assembling 13,000 to 14,000 bodies weekly and has issued releases for sheets for the remainder of February. Autobody sheets are firm at 3.30c, Pittsburgh. Metal furniture sheets are unchanged at 3.60c, Pittsburgh. The local sheet plant of Empire Steel Corp., Mansfield, O., continues with four of six hot mills on.

Chicago—Sheet mills are able to schedule a full week's production again, after a half week of activity. Operations are 50 to 55 per cent, compared with about 40 per cent last week. Indiana Harbor mills are on full, with diversified orders. While concessions on galvanized sheet roofing products in the Southwest are being made, the mill price is reported steady in the northern markets at 3.00c for No. 24 galvanized.

New Galvanized Extras

The American Sheet & Tin Plate Co. late Tuesday, Feb. 17, announced a new list of wide extras for galvanized sheets.

Current Finished Steel Prices

Prices in cents per pound unless otherwise stated

Steel Sheets

SHEET MILL BLACK, NO. 24

Pittsburgh base	2.35c
Philadelphia, delivered	2.64c
Gary, Indiana Harbor	2.45c
Chicago, delivered	2.50c
Birmingham, base	2.50c
St. Louis, del.	2.70½c

TIN MILL BLACK, NO. 28

Pittsburgh, base	2.55c to 2.65c
Gary, base	2.65c to 2.75c

GALVANIZED NO. 24

Pittsburgh, base	2.90c
Philadelphia, delivered	3.19c
Chicago, delivered	3.05c
Gary, Indiana Harbor	3.00c
Birmingham, base	3.05c
St. Louis, del.	3.25½c

BLUE ANNEALED SHEETS NO. 13

Pittsburgh, base	2.05c
Chicago, district mills	2.15c
Chicago, delivered	2.20c
St. Louis, delivered	2.40½c
Philadelphia, delivered	2.34c
Birmingham	2.20c

BLUE ANNEALED SHEETS NO. 9-10

Pittsburgh, base	1.90c
Chicago, district mills	2.00c
Chicago, delivered	2.05c
Philadelphia, delivered	2.19c
St. Louis, delivered	2.25½c
Birmingham	2.05c to 2.10c

AUTOMOBILE NO. 20

Pittsburgh, base	3.30c

FURNITURE NO. 24

Pittsburgh, patent leveled	3.60c

Tin and Terne Plate

Prices per 100 pound box Pittsburgh

Tin plate, coke base	$5.00

Gary, Ind., base 10 cents higher.

(Per pound)

Long ternes, 24, assorted	3.35c to 3.45c
Long ternes, 24, unassorted	3.25c to 3.35c

Wire Products

(To Jobbers-Merchant Trade)

F.o.b. Pittsburgh, Cleveland base

(Per 100 pound keg)

Standard wire nails	$1.90 and 2.00
Cement coated nails	1.90 and 2.00
Galvanized nails	3.90 and 4.00

(Per pound)

Polished staples	2.35c and 2.45c
Galvanized staples	2.60c and 2.70c
Barbed wire, gal.	2.55c and 2.65c
Annealed fence wire	2.35c and 2.45c
Galvanized wire	2.80c and 2.90c

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.20c to 2.30c
Spring wire	3.20c
Wire, delivered Detroit	2.50c
Nails, delivered Detroit	$2.35

Joliet, DeKalb, Wauegan, Ill., Anderson, Ind., Chicago, $1 over Pitts.-Cleve.; Duluth and Worcester, Mass., $2 higher; Fairfield, Ala., $3 higher.

Rivets

Struc. c.l., Pitts.-Cleve.	2.75c
Struc., c.l., Chicago	2.85c
**7/16-inch and smaller, Pitts.	70, 10 and 5 off
Chi., Cleve.	70 to 70, 10 and 5 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Steel Plates

Base, Pittsburgh	1.60c to 1.65c
Philadelphia, del.	1.80½c to 1.85½c
New York, delivered	1.88c to 1.93c
Boston, delivered	2.00c to 2.05c
Chicago, base	1.70c to 1.75c
Cleveland, delivered	1.78½c to 1.83½c
Lackawanna, N. Y., base	1.70c to 1.75c
Birmingham, base	1.75c to 1.80c
Coatesville, Pa., base	1.70c to 1.75c
Pacific Coast, c.i.f.	2.05c to 2.15c
St. Louis, del.	1.95½c

Structural Shapes

Base, Pittsburgh	1.60c to 1.65c
Philadelphia, del.	1.81c
New York, del.	1.905c
Boston, del.	1.985c to 2.035c
Chicago, base	1.70c to 1.75c
Cleveland, delivered	1.78½c to 1.83½c
Lackawanna, N. Y., base	1.75c to 1.80c
Birmingham, base	1.75c to 1.80c
Pacific Coast, c.i.f.	2.15c to 2.25c

Bars

SOFT STEEL

Pittsburgh, base	1.60c to 1.65c
Chicago, base	1.70c to 1.75c
Birmingham, base	1.75c to 1.80c
Lackawanna, N. Y., base	1.70c to 1.75c
Pacific Coasts, c.i.f.	2.25c
Cleveland, base	1.65c to 1.70c
Philadelphia, del.	1.94c
New York, del.	1.98c
Boston, del.	2.05c
Pittsburgh, cold finish	1.75c to 1.80c
Pittsburgh, forg. qual.	1.85c to 1.90c

RAIL STEEL

Chicago Heights	1.60c to 1.65c
Eastern mills	1.65c

IRON

Chicago, base	1.75c
New York, delivered	1.93c to 2.03c
Philadelphia, delivered	1.89c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pitts., billet cut lengths	1.90c to 2.00c
Stock lengths, mill	1.65c to 1.75c
Chi. billet	2.00c
Chi., rail steel	1.60c to 1.70c
Philadelphia, cut lengths	2.19c
Cleveland, cut lengths	1.95c to 2.05c

Cold-Finished Steel Bars and Shafting

Base, Pittsburgh, Chicago, Buffalo and Cleveland	2.10c
Shafting, turned and ground, mill	2.45c to 2.90c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel

Sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot strip	19c	20.5c	23c	28c
Cold strip	28c	29.5c	32c	37c

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Wrought Washers

Carloads, Pitts. dist.	$6.50 to $6.75 off
Carloads, Chicago dist.	6.70 to 6.80 off

Alloy Steel

Hot Rolled—F.o.b. Mills

Alloy Quality Bar Base is 2.65c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	1.25-1.75 Ni.	1.05
2100	0.55	5100 .80 - 1.10	
2300	1.50	Cr.	0.45
2500	2.25	51.00 Cr.	
3100	0.55	spring	0.20
3200	1.35	6100 bars	1.20
3300	3.80	6100 Spring	0.95
3400	3.20	Cr., Ni., Van.	1.50
4100 .15 to .25		Carbon Van.	0.95
Mo.	0.50	9250 (flats)	0.25
4600 .20 to .30 Mo.		9250 (rds., sq.)	0.50

Strip, Hoops, Bands

Hot strip, to 6-in., Pitts.	1.65c to 1.70c
Hot strip 6 1/16 to 24-in. Pitts.	1.55c to 1.60c
Hot strip, bands 6 in. and under, Chicago	1.75c
Do. 6 1/16 to 24 in.	1.65c
Cooperage hoop, Pitts.	1.90c to 2.00c
Do, Chicago	2.00c to 2.10c
Cold rolled strip, Pitts., Cleve., 3 tons, over	2.25c to 2.35c
Worcester, 3 tons, over	2.40c to 2.50c

Rails, Track Material

Standard bess. and open hearth rails, mill	$43.00
Relay rails, Pitts., 60 to 90 lb.	$24.00 to 28.00
Light rails, 25-45, mills	$34.00
Light rails, Chicago	$46.00
Angle bars, Chi. base	2.75c
Spikes, railroad, mills	2.80c
Spikes, railroad, 7/16-in. and smaller, Pitts.	2.80c
Spikes boat, barge, Pitts.	3.00c
Spikes, railroad, Chi.	2.80c
Track bolts, Pitts., steam roads	3.80c
Do. standard, jobbers	73 off list
Track bolts, Chicago	3.80c
Tie plate, mills	$39.00

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham and Chicago

Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930, lists.

CARRIAGE BOLTS

All sizes, cut thread ..... 73 off

Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.

Eagle list ..... 73 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ..... 73 off

Tire bolts, 60, 10 and 10 off.

Stove bolts, 80, 10, 10, 5 off in pkgs.; 80, 10, 5, 2½ off in bulk.

Rolled thread machine bolts, ⅜ x 6 and smaller take 10 per cent lower list.

NUTS

Semifinished ..... 73 off

HEXAGON CAP SCREWS

Milled ..... 80-10-10-5 off

Upset 1 in. diam. and smaller ..... 85-10 off

SQUARE HEAD SET SCREWS

Milled ..... 80-5 off

Upset 1 in. and smaller ..... 80-10-5 off

Upset, larger than 1 in. ..... 80-5 off

Cut Nails, Chain, Piling

Cut nails, c.l., Pittsburgh	2.40c

do, less carloads, 5 kegs or over, 2.65c; and less than 5 kegs, 2.80c.

Chain, BB, BBB, 9/16-1½ in.	33 1/3 off
Sheet piling, Pitts.	1.90c

Bars

Some Improvement Noted But in General, Market Is Unchanged—Price Rise Talked

BAR PRICES, PAGE 71

Chicago—Steady gains that have characterized bar and other finished steel specifications since the first of the year are continued. Shipping orders for all products were the second best of any week this year. Sales are light, largely miscellaneous small lots, but the range holds at 1.70c to 1.75c, Chicago. Bar iron is 1.75c. Bar orders now are 60 per cent over the January average, following recent gains in deformed bar orders, automotive frame material, cold finished and miscellaneous orders. Road machinery builders will become more active about March 1. A heavy season is scheduled.

New York—While improvement in steel bar specifications is small, the market is steady at 1.65c, Pittsburgh, on new business. The contract price of 1.60c also is firm. Common iron bars are 1.60c to 1.70c, Pittsburgh.

Philadelphia—Steel bar demand has expanded further with the price firm at 1.65c, Pittsburgh. This improvement and prospects for further gain are reviving talk of an advance of $1 for second quarter. Common iron bars are holding at 1.60c, Pittsburgh, 1.70c, quoted officially in some quarters, being largely nominal. Ship demand for iron bars continues fairly good and there is increasing interest from northern Pennsylvania coal fields. Railroads are specifying little and their situation generally is little changed.

Pittsburgh—Demand for steel bars is unimproved over recent weeks. Orders continue spotty and in small lots for prompt shipment, with consumers showing only occasional interest in future needs. The recent report of a proposed advance on second quarter tonnage has stimulated some inquiry but producers have not named prices for that period. The market usually is 1.65, with most buyers covered on lower priced contracts.

Youngstown, O.—Steel bar users are expanding their demands slightly but steadily, leading to similar expansion in bar mill operations. The bars are moving into a wide variety of uses. Auto partsmakers continue to furnish most of the growing business in alloy steel bars. Common steel bars are firm at 1.65c, Pittsburgh.

Cleveland — Merchant steel bar sales are steady but below normal. Demand is fairly well diversified from consuming interests. The 1.65c to 1.70c, Cleveland base, to both local and outside points is being made on all new contracts. Interest is not overly active in second quarter, general contracting for which has not been started.

Cold-Finished Bar Sales Still Small in Aggregate

Cold Finished Prices, Page 71

Pittsburgh — Cold-finished steel bar specifications continue at about the rate of the preceding several weeks. Orders from the automotive industry are steady but what improvement is noted is spotty. Orders from other consumers are in unchanged volume. The market continues 2.10c, Pittsburgh.

Cleveland — Little cold-finished screw stock bar tonnage is moving in aggregate among all sellers, and no consuming interest is outstanding in its commitments. The 2.10c, Cleveland, price is nominally holding to the trade; sellers say their only concession is to jobbers.

Tin Plate Production Now at 70 Per Cent Rate

Tin Plate Prices, Page 71

Pittsburgh—Tin plate operations have resumed the upward trend that has prevailed during most of the weeks this year. Average output for the industry now is around 70 per cent, and in view of a further gain in business operating schedules are expected to move still higher during coming weeks. Recent specifications have been moderately heavier and give a fair outlook to the usually active spring production period. Tin plate continues $5 per base box, Pittsburgh.

New York—Six thousand boxes of tin plate has been booked here for Japan.

Iron Works at Capacity

The Mead-Penn Iron Works, Meadville, Pa., has resumed operations on a capacity schedule following receipt of orders for 700 tons of refinery equipment which it manufactures.

Plates

More Interest Manifest in Prices for Second Quarter—Tank Prospects Have Improved

PLATE PRICES, PAGE 71

Chicago—Plate mills at 50 per cent need railroad car orders to assure backlogs after the pending line pipe orders are filled in about 30 days. Skelp shipments on pipe line orders have been reduced to 4000 to 5000 tons weekly from this district. Plate prices are reported steady at 1.70c, base, although new sales are light. Oil tank prospects are improved. One producer has booked 1400 tons in three lots for the Southwest, and another is supplying 500 tons for Kansas and Colorado refinery projects. About 1000 tons of miscellaneous tank work is on inquiry.

New York—Plate business is moderate, with few outstanding tonnages. Pipe work is at low ebb. Ship work is in prospect, the cruiser No. 37 requiring 4000 tons. This is the only active job at present. Operations are 40 to 50 per cent.

Philadelphia — Plate prices are holding at 1.70c to 1.75c, base, Coatesville, Pa. Inquiry for 4000 tons of plates for cruiser No. 37, just awarded the New York Shipbuilding Co., features a slightly brighter market. Mill operations are unchanged at 40 to 50 per cent.

Pittsburgh—Plate business is fairly steady despite the lack of large orders. Barge awards continue to take small lots. Second quarter inquiry is lacking and the 1.65c, Pittsburgh, price remains to be tested. This price is being applied on the light volume of business appearing in the open market.

Cleveland—Increased interest is manifest in more consumers asking for quotations. Orders are small. The 1.65c, Pittsburgh, price is adhered to. The Wright Field (Ohio) hangars, bids to be opened Feb. 27, for which 11,000 tons of structural shapes are required, will take an unstated amount of plates for sliding doors and partitions. Nickel Plate railroad will take large plates in the

ten locomotives for which it is now inquiring.

Contracts Placed

330 tons, 33 barges, for United States engineers, Louisville district, to Jones & Laughlin Steel Corp., Pittsburgh.

Contracts Pending

4000 tons, cruiser No. 37; general to New York Shipbuilding Co., Camden, N. J.; 2000 tons of shapes and bars will also be required.

Financial Notes of Steel And Iron Industry

(*Concluded from Page* 20)

cents a share, in comparison with $407,439, or $4.18 a share in 1929.

□ □ □

Van Dorn Iron Works Co., Cleveland, had net profit of $113,792 in 1930, which compares with $83,271 in 1929.

□ □ □

United Steel Works, Dusseldorf, Germany, has declared dividend of 4 per cent, compared with 1929 dividend of 6 per cent.

□ □ □

Diamond Iron Works, Minneapolis, has omitted quarterly dividend due about Feb. 1 on common stock. Last quarterly payment was 50 cents a share on Nov. 1, 1930.

□ □ □

Continental Steel Corp. Kokomo, Ind., reports net loss of $37,098 for 1930. In 1929 the company had net profit of $932,030, equal to $4.01 a common share.

□ □ □

Page-Hersey Tubes Ltd., Toronto, Ont., showed total income of $1,801,866 in 1930, compared with $1,970,139 in 1929. After dividends, surplus of $940,703 for the year increased total surplus to $3,400,740.

□ □ □

American Machine & Foundry Co., Brooklyn, N. Y., announces through Central Hanover Bank & Trust Co., that $39,000 of 15-year, 6 per cent secured sinking fund gold bonds due April 1, 1939 have been designated for redemption at 103 and interest on April 1, 1931.

□ □ □

Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., is offering $175,000 of an authorized issue of $300,000 of 6 per cent first mortgage bonds, proceeds to be used to reimburse the treasury for money used to retire all present outstanding bonds, and for development work on new machines.

Railroads

Heavier Rail Releases Being Received by Western Mills—Nickel Plate Distributes 27,400

TRACK MATERIAL PRICES, PAGE 71

Chicago—Railroads having rail orders with western mills are beginning to release deliveries and urge shipments, which heretofore have been lagging. Union Pacific is asking shipment on round lots of rails and fastenings against this year's purchases, while Illinois Central, not having ordered rails this year, recenely has specified more than 10,000 tons with Chicago and Birmingham mills against last year's carryover. The week just closed marked another 10,000-ton track fastenings period. Orders included fastenings for New York Central, Burlington, Erie, and several other railroads. Despite the more urgent rail shipping orders from roads which were generally behind in rail programs, rail mill operations in the Chicago district will temporarily remain at 50 per cent. Missouri Pacific has awarded 1000 tons of car parts to three builders.

New York—While at least one fair-sized list is expected to be placed momentarily, car demand is sluggish. New inquiry is virtually negligible. Locomotive inquiry includes 10 for the Western Pacific.

Including 1200 hoppers, Bessemer & Lake Erie railroad on which action is expected within a week approximately 1650 freight cars are actively pending.

Philadelphia — Pennsylvania railroad is placing orders for spikes against recent bids of 2.70c, f.o.b. mill. Approximately 7500 kegs will eventually be placed in all.

Pittsburgh—Activity in the track accessory market is confined to a few roads. New York, New Haven & Hartford railroad has closed on its recent inquiry for track material while the Norfolk & Western is inquiring for 3000 kegs of spikes.

Cleveland—Nickel Plate will defer for another week definite allocation of 27,400-ton rail order awarded among Illinois Steel Co., Carnegie Steel Co., Inland Steel Co., and Bethlehem Steel Co Track fastenings on the same order will be out in another ten days. The Nickel Plate has ten locomotives also pending.

Toronto, Ont.—National Steel Car Corp. has placed the following orders for material in connection with rolling stock orders recently received from the Canadian National and Canadian Pacific railways, the former being for 1000 steel box cars and the latter 250 refrigerator cars: Dominion Foundries & Steel Ltd., castings; Canada Iron Foundries, wheels; Brown-Boggs Foundry & Machine Co., gray iron castings; Pratt & Letchworth, malleable castings; Steel Co. of Canada Ltd., bars and shapes; Algoma Steel Corp., shapes; Dominion Steel & Coal Co., steel; Canadian Westinghouse Co., air brakes; and lumber will be supplied by British Columbia companies.

Car Orders Placed

Byllesby Engineering & Management Corp., two gondolas, to General American Car Corp., Chicago.

Freedom Oil Works Co., Freedom, Pa., seven tank cars, to General American Tank Car Corp., Chicago.

Missouri Pacific, parts for 1000 steel cars, 200 to Pennsylvania Car Co., Kansas City, and 400 each to Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill., and American Car & Foundry Co., St. Louis.

Wheeling Steel Corp., repairs to fifteen 55-ton hopper cars, to Pressed Steel Car Co., Pittsburgh.

Locomotives Placed

Chicago & Illinois Midland, two locomotives, to Lima Locomotive Works, Lima, O. A total of five locomotives have been placed recently by this railroad, augmenting three reported placed with the same company in STEEL of Feb. 12.

Government of Ecuador, one locomotive for F. C. Quito Esmeraldas, to Baldwin Locomotive Works, Eddystone, Pa.

Rail Orders Placed

Richmond, Fredericksburg & Potomac, 3500 tons, Bethlehem Steel Co., Bethlehem, Pa.

Car Orders Pending

Houston Oil Terminal Co., 4 or 5 10,000-gallon tank cars for carrying asphalt.

Board of transportation, New York, 16 miscellaneous cars as previously noted in STEEL of Feb. 12; bids open Feb. 20.

Locomotives Pending

Nickel Plate, 10 locomotives.

Western Pacific, 10 locomotives.

Plate Institute Meets

Representattives of 15 steel plate fabricators of the newly-organized Institute of Steel Plate Construction, New York, met in Pittsburgh, Feb. 12. The meeting was held for the purpose of discussing the progress of the organization and the program.

Structural Shapes

Small Jobs Most Active in East Where Public Work Forms Bulk of Inquiry—21,500 Tons Up March 2—Awards Small This Week, Led by 1200-Ton Hospital

STRUCTURAL SHAPE PRICES, PAGE 71

New York—The market on plain material is holding firm at 1.905c, New York, on new business. Fabricators are gradually working off steel bought at lower prices and fabricated prices are slowly reflecting firmer stand by the mills. Most new inquiry is for public work. Apartment and industrial building shows little activity. About 2000 tons additional are required for highway bridges in New Jersey. This is in addition to 21,500 tons on which bids will be taken March 2. Small jobs, taking 100 tons or less, are fairly active.

Boston.—Building projects have been showing a falling off in the past four weeks. The Boston postoffice job will be refigured, so that this project is some time off, though it is not expected that the tonnage in steel will be changed from the original plans. Otherwise there is little local inquiry.

Philadelphia—Structural demand has expanded moderately with some shapes firmer at 1.75c, mill, or 1.81c, Philadelphia. Several jobs involving 500 tons and over are active. Further increase in interest is anticipated as spring approaches.

Pittsburgh—Structural steel is quiet, local awards and inquiry being light while specifications for plain material lack improvement. Inquiry continues fair but involves few large lots. Plain shapes usually are quoted 1.65c, Pittsburgh.

Cleveland—South high school, taking 565 tons, was awarded to Kilroy Structural Steel Co. The General Electric Co. wire plant, award of 1000 tons of structurals for which was noted last week as going to the Austin Co. will be redesigned by the latter company. Steelwork will be electric-welded. Local inquiry is light. The John Carroll university project, taking some 200 tons of shapes, will call for roof trusses and angles largely. Sellers claim the 1.65c, Pittsburgh, base as the going figure on fresh ordering.

Industrial Brown Hoist Corp. has approximately 500 tons of shapes pending for a plant to be erected at Bay City, Mich. Glenville and City hospital jobs are pending.

Chicago—Headed by 10,000 tons for steelworks expansion at Indiana Harbor, structural steel inquiries are about 23,000 tons. Awards are chiefly small lots. Structural mills are operating only about 40 per cent on orders carried over from last year, or on small?lot jobs. Plain material is quoted 1.70c to 1.75c, Chicago. Railroad bridge work holds out more promise than building. The Marshall Field estate building, about 25,000 tons, will not become active until late this year.

Birmingham, Ala.—Several small orders were booked the past week and shops are operating 5 to 5½ days a week. Bids are out on several contracts of more than average size. Ingalls Iron Works received 400 tons for a highway bridge in Louisiana.

Contracts Placed

1200 tons, building, Jersey City hospital, to Lehigh Structural Steel Co., Allentown, Pa.

1000 tons, Clark Thread Co. building, Austell, Ga., to McClintic-Marshall Co., Pittsburgh.

925 tons, deep water pier and warehouse for Canadian National Steamships, Vancouver, B. C., to Western Bridge Co., Vancouver.

586 tons, postoffice addition, Tulsa, Okla., to Rochester Bridge Co., Rochester, Ind. Charles Weitz Sons, Des Moines, Iowa, general contractors.

565 tons, South high school, Cleveland, to Kilroy Structural Steel Co., Cleveland. Aronberg-Fried Co., general contractor.

500 tons, bridge work, Blairstown, Iowa, for Chicago & North Western railroad, to American Bridge Co., Chicago.

490 tons, warehouse, New York, for Crane Co., to Post & McCord Inc., New York.

450 tons, public school No. 106, New York, to Easton Structural Steel Co., Easton, Pa.

450 tons, state bridges for Illinois highway commission to Continental Bridge Co., Chicago, and Illinois Steel Bridge Co., Jacksonville, Ill.

450 tons, apartment, 168th street, New York, to Prudential Iron Works, New York. H. Ginsberg, architect. Noted awarded Feb. 12 in STEEL without mention of fabricator.

440 tons, bridges for Illinois Central railroad, to American Bridge Co., Pittsburgh, Virginia Bridge & Iron Co., Roanoke, Va., and Continental Bridge Co., Chicago.

400 tons, highway bridge, Louisiana, to Ingalls Iron Works Co., Birmingham, Ala.

360 tons, International house, University of Chicago, to Union Foundry Works, Chicago.

330 tons, tank supports, Pensacola, Fla., for Louisville & Nashville railroad, to Chicago Bridge & Iron Works, Chicago.

325 tons, highway bridge, Beaver Creek, Wis., to Lakeside Bridge & Steel Co., North Milwaukee, Wis.

300 tons, highway bridge, Beloit, Wis., to Hanson & Beckman, Rockford, Ill.

300 tons, plant addition, James B. Clow & Sons, Coshocton, O., to Jones & Laughlin Steel Corp., Pittsburgh.

270 tons, administration building for airport, Brooklyn, N. Y., to Kues Bros. Iron Works, Bronx, New York.

200 tons, office building Pampa, Tex., to J. B. Klein Iron & Foundry Co. Oklahoma City, Okla.

175 tons, private school, Goshen, N. Y., to Bethlehem Fabricators Inc., Bethlehem, Pa.; joists to Concrete Steel Co., New York.

160 tons, Washington high school, Rochester, N. Y., to McClintic-Marshall Co., Pittsburgh.

150 tons, library, Bayonne, N. J., to Globe Iron Works, Bayonne; G. Siegler Co. Inc., general contractor.

150 tons, apartment, Marine avenue and Fourth avenue, Brooklyn, N. Y., to Berkshire Structural Steel Co., Brooklyn, N. Y.

125 tons, restaurant building, 170 Seventy-second street, New York, to George A. Just Co., Long Island City, N. Y.

110 tons, 30 antenna towers, for department of commerce, to International Derrick & Equipment Co., Columbus, O.

100 tons or more, state highway bridge, Montana, to unstated interests through Portland Bridge Co., Portland, Oreg., general contractor.

100 tons, addition, Town hall, Oyster Bay, N. Y., to J. Klein Iron Works, Astoria, N. Y.; general contractors, Oliver Bros., Oyster Bay.

100 tons, state bridge over Quinnehog river, Hartford, Conn., to Berlin Construction Co., Berlin, Conn.

100 tons, two apartments, Twenty-eighth and Thirtieth streets, Long Island City, to Emilnick Iron Works, Astoria, N. Y.

Awards Compared

	Tons
Awards this week	**10,361**
Awards last week*	**21,525**
Awards two weeks ago	**17,044**
Awards this week in 1930	**34,405**
Av. weekly awards, 1930	**35,242**
Av. weekly awards, 1931	**23,002**
Av. weekly awards, Jan.	**27,018**
Tot. awards to date, 1930	**276,479**
Tot. awards to date, 1931*	**184,019**

*Revised

Contracts Pending

21,500 tons, fabrication and erection, steel superstructure for highway viaduct from Newark avenue to Hackensack river, Jersey City, N. J., bids March 2, state highway commission, New Jersey. Material for work also includes 745 tons of steel castings and 12,510 feet of steel railing.

4000 tons, Wells high school, Chicago.

3500 tons, club and office building for Motorists' Association of Illinois.

3000 tons, electrical group, Chicago Century of Progress exposition.

2000 tons, three bridges, New Jersey state highway commission; bids March 2. Work comprises 1000 tons,

route 4, sections 3 and 4; 810 tons, route 4, section 4; and 90 tons, route 1, section 6.

1800 tons, Harlem avenue bridge, Chicago, general contract to Kettler-Elliott Co.

1040 tons, bridge, Hackensack river, route 4, sections 3 and 4, Bergen county, N. J.; bids March 2.

1000 tons, bridge over Kettle creek, St. Thomas, Ont., for Pere Marquette railroad.

1000 tons, Red Cross building, Washington; McCloskey & Co., Philadelphia, awarded general contract.

1000 tons, post office, Camden, N. J.; bids March 4.

810 tons, four bridges, route 4, section 4, Arcola to Hackensack river, Bergen county, N. J.; bids March 2.

600 tons, hydroelectric development, Safe Harbor, Pa.; bids asked through Arundel Corp., Baltimore, general contractor.

600 tons, power plant, Bowling Green, Ky., for Metropolitan Edison, Gas & Electric Co.

600 tons, bridge over Grand Calumet river for Chicago, South Shore & South Bend railroad.

550 tons, bridge, Frenchtown, N. J.; H. F. Clement, Bethlehem, Pa., low on general contract.

505 tons, five bridges, route 4, section 3, Bergen county, N. J.; bids March 9.

500 tons, plant, Bay City, Mich., for Industrial Brownhoist Corp., Cleveland.

450 tons, municipal pier No. 11, Philadelphia.

350 tons, theater, Hackensack, N. J.

300 tons, state highway bridge, Trempeleau county, Wis., Milwaukee Bridge Co., Milwaukee, low.

250 tons, apartment, East Thirty-seventh street, New York.

150 tons, bridge, Erie county, N. Y.; bids Feb. 17.

125 tons, 225-foot span, Mt. Baker forest reserve, Washington; bids Feb. 25.

100 tons, bridge, Port Rouge, Que., for town council.

Bethlehem Employes' Relief Benefits $4,224,000

The sum of $473,145 in death benefits was paid to families of 664 employes of Bethelem Steel Corp., and $536,148 was paid to 7006 participants in the relief fund in 1930, as reported recently at the annual meeting of the Bethlehem general relief board in Bethlehem, Pa. The plan is operated by a board of trustees composed of employes and management representatives. Since its inauguration in June, 1926, payments aggregating $4,224,363 have been authorized.

A new illustrated booklet dealing with the application of heat to core baking has been published by the committee on industrial gas research of the American Gas association, 420 Lexington avenue, New York. The material represents results of research work by H. L. Campbell, associate professor of metallurgical engineering, University of Michigan, Ann Arbor, Mich.

Concrete Bars

Minnesota Highway Work Takes 2000 Tons—Heavy Road Work in West; Bridges, Underpasses Pending in New Jersey—Awards Are 6498 Tons

REINFORCING BAR PRICES, PAGE 71

New York—Concrete reinforcing bars are steady at 1.65c, Pittsburgh, with demand largely confined to public work. Private jobs are generally under 100 tons each and are few. A sewage disposal plant on Ward's island will take approximately 6500 tons. Several hundred tons will be required for substations in connection with the West side development program by the New York Central railroad. More than 1000 tons are included in several contracts to be let by the highway commission of New Jersey March 2. This includes both road reinforcement, bridges and under-passes.

Boston — Conditions show but little change for the concrete bar makers. Not more than 100 tons was done in small jobs this week, but the Concrete Steel Co. was awarded contract for 750 tons for the New England Telephone & Telegraph Co. building at Watertown, Mass. Little inquiry is up. Prices continued to show easing when sizable jobs are being figured.

Pittsburgh—Shipments of reinforcing bars against orders are holding at about the January rate while new business is slow. Prospective work is fair but inquiry involves only small lots. Awards remain light in this district.

Cleveland—Columbus, O., office building, originally specifying structural shapes and which was changed to reinforcing was let to Hausman Steel Co., Toledo, O., through E. Elford & Son, Columbus, O. Local awards this week are confined to small lots with the May Co. addition and South High school projects still pending.

Chicago—Illinois road work already planned for this year will take 10,000 tons of reinforcing bars. Iowa's quota is 8000 tons, and Minnesota has purchased 5000 tons. Indiana and Wisconsin are in the market for undetermined amounts. Rail steel bars for road work are 1.60c to 1.65c. A number of small-lot building awards are being closed. Inquiries are fair.

Birmingham, Ala.—With a few orders from consumers through contractors there are steady shipments from this district. No inquiry of size is reported. Prospects brighten.

Awards Compared

	Tons
Awards this week	6,498
Awards last week	6,820
Awards two weeks ago	4,631
Awards this week in 1930	8,750
Av. weekly awards, 1930	6,990
Av. weekly awards, 1931	6,075
Av. weekly awards, Jan	7,331
Total awards to date, 1930	35,339
Total awards to date, 1931	54,602

Contracts Placed

2000 tons, road work for Minnesota highway commission, direct to several unstated mills.

1000 tons, office building, First National Bank & Trust Co., Oklahoma City, Okla., to J. B. Klein Iron & Foundry Co., Oklahoma City, Okla. Manhattan Construction Co., Tulsa, Okla., general contractors.

750 tons, Watertown, Mass., New England Telephone building, to Concrete Steel Co., New York.

530 tons, subway section No. 3, Newark, N. J., to Joseph T. Ryerson & Son Inc., Jersey City, N. J.; through Thomas Crimmins, New York, general contractor.

313 tons, Eleanor McMain high school, New Orleans, to Laclede Steel Co., St. Louis. General contract to J. A. Petty & Sons, New Orleans.

300 tons, office building, Columbus, O., to Hausman Steel Co., Toledo, O. General contract to E. Elford & Son, Columbus, O.

300 tons, sewage work, Chicago sanitary district, to several unstated fabricators.

200 tons, Alexander Hamilton school, Los Angeles, to unstated company.

175 tons, barracks, Fort Slocum, N. Y., to Concrete Steel Co., New York, through Caster & Caster Engineering Corp.

170 tons, Central state farm prison, Sugarland, Tex., to Alamo Iron Works, San Antonio, Tex.

170 tons, state bridge, Boise, Idaho, to unstated interest, through Morrison Knudsen Co., Boise, Idaho, general contractor.

160 tons, Reserve Lithograph & Printing Co. plant, Cleveland, to Republic Steel Corp., Youngstown, O.; general contract to Sam W. Emerson Co., Cleveland.

130 tons, school, River Forest, Ill., to Olney J. Dean & Co., Chicago.

100 tons, state highway bridge, Twin Falls, Idaho, to unstated interest through D. J. Cavanaugh, general contractor, Twin Falls.

100 tons, arsenal, Hawthorne, Nevada.

(*Concluded on Page* 79)

Strip

Improved Demand Appears in All Markets—Specifications Are Above Those of January

STRIP PRICES, PAGE 71

Pittsburgh — Strip specifications and operations show more definite improvement. Demand is diversified and the increase in buying is from miscellaneous consumers as well as from automotive interests. Specifications for most producers are moderately ahead of the corresponding January tonnage while operations, which held around 35 per cent early in February, have been advanced to 45 to 50 per cent, with some mills as high as 60. Backlogs still are lacking, orders being limited to small lots. Prices are fairly steady at minimums of 1.55c and 1.65c for hot strip and 2.25c for cold-rolled material.

New York—While demand is light, prices on strip are steady. Hot rolled is holding 1.55c, Pittsburgh, for wide and 1.65c, for narrow. Cold rolled is 2.25c, Pittsburgh, with some small lots at 2.35c.

Philadelphia — Demand for steel strip shows some improvement and price is firm at 2.25c, Pittsburgh, for cold-rolled. Hot-rolled strip is 1.55c, Pittsburgh, for wide and 1.65c for narrow. Prompt shipments are available, particularly for hot-rolled. Demand for hot and cold strip, both medium and narrow widths, has shown no sign of abatement. In fact, February shipments steadily have gained over January and still are growing. A wide variety of uses to which strip is being applied appears itself to be extending, led as to tonnage by the automotive industry. Both hot and cold-rolled strip are in such strong demand that quotations are firm, in fact about the firmest in finished material. Hot-rolled strip is 1.65c to 1.70c, Pittsburgh, and cold-rolled is 2.25c to 2.35c, Pittsburgh and Cleveland, depending upon quantity and widths.

Cleveland—Demand for cold-rolled strip is not up to consumers' normal needs and buying does not severely test 2.25c, Pittsburgh and Cleveland, base. Hot strip is more active, also below usual volume. Price on the latter continues unchanged at 1.55c, Pittsburgh, for wide and 1.65c, Pittsburgh, for narrow.

Chicago — Hot-rolled strip mills are on a 40 to 45 per cent production rate with fair miscellaneous and automotive releases. Wider sizes of hot-rolled are 1.65c, Chicago, while material under 6-inches now is quoted a straight 1.75c instead of a range. Cold-rolled automotive releases thus far are not substantial in this district, but specifications have gained slightly in the last 30 days. The cold-rolled price is 2.25c to 2.35c, Pittsburgh-Cleveland.

Operating Rates Show Further Gains Over Country

Youngstown, O. — Twenty-nine open hearths are melting this week against 28 last week, out of 51 available for independents. Corporation activity remains at 50 per cent. Steel plant operations in this district are unchanged from last week at 50 per cent, but schedules of individual companies are fluctuating more than in any other week this year. Advance of 5 points to 55 per cent level in activity of Republic Steel Corp. and resumption at both Empire Steel Corp.'s Falcon plant and the Mahoning Valley Steel Co.'s plant offset losses in operations for Youngstown Sheet & Tube Co. and Sharon Steel Hoop Co.

Sheet & Tube's schedule is at 40 per cent, off 5 points from last week. Slight tapering in Sharon Steel's sheet production at Youngstown accounts for a three point loss to 70 per cent of capacity.

The most impressive development in the district this week is the further increase in ingot production for Republic. Schedule shows open-hearth capacity in Republic's Youngstown and Warren plants is 80 per cent engaged, indicating that finishing department activity shortly may expand. Sheet production in the district is distinctly higher at 45 per cent, against less than 40 per cent this week, while lap-weld pipe production shows further losses. Tin mill production continues at a high rate. Carnegie Steel operations are unchanged at 50 per cent. Newton Steel Co.'s sheet plant is at 70 per cent of capacity.

Philadelphia—Eastern ingot production is at 51-52 per cent of capacity, a gain of two points. A leading producer is operating in excess of 54 per cent.

Buffalo—Operations show another very substantial gain this week, rising from 54 to 59 per cent of open-hearth capacity. A gain at Lackawanna is responsible for advance.

Pittsburgh—Ingot production continues at about 47 per cent of capacity. One blast furnace has been blown out and another banked during the week, leaving 18 of 54 active. Finishing mill schedules are tending upward, tin plate now being at 70 although sheet production remains slightly below 40. Strip output is higher at 45 to 50 with pipe mills continuing at 35.

Cleveland—After last week's rise to the highest ingot production rate for the district since the third week in July, 1930, active open hearths dropped from the 53 per cent level to 50 per cent actively engaged. Seventeen of 34 are on, 12 of which are independent.

Chicago—District ingot production rate again is up to 48 to 50 per cent against 47 per cent a week ago. The leading interest has a banked blast furnace at Gary, expected to go in shortly. Finishing mill operations are virtually unchanged from a week ago, except sheet mills now are 50 to 55 per cent, a gain of 5 to 10 points.

Birmingham, Ala.—Ingot operations have been stepped up seven points, at 65 per cent this week, 16 of 23 open-hearth furnaces being in operation.

Warehouse Sales Slowly Improve Over January

Warehouse Prices, Page 93

New York—A small improvement is noted in jobbing demand, with prospects of a further gain as spring building season approaches. Meanwhile, prices show better tone, with various minimums unchanged.

Chicago — Warehouse sales this month have gained slowly. Estimates of sales are about 5 per cent ahead of January. Orders are small with buying well diversified, except in sheets. A marked pick-up is expected in March. Prices are unchanged.

Philadelphia—Sales from stock are not up to last week. February so far shows a small gain over January. Prices are steady.

Pittsburgh—Sellers report a mild upturn in demand for the first time this year. Buying still is not well distributed and total activity represents little change since the slow January period. Prices are unchanged.

Buffalo—Warehouses report continuing improvement in demand comparable with the generally better tone of the industry. The quarter is taking a widening lead in sales, compared with the last quarter.

Cincinnati—Jobbers here report that slight gains, noted earlier this month, are holding.

Concrete Bars

(*Concluded from Page 75*)

to unstated company.

100 tons, foundation, Hunter college unit, New York, to Joseph T. Ryerson & Son Inc., Jersey City, N. J.

Contracts Pending

6500 tons, estimated, sewage disposal plant, Ward's island, New York.

650 tons, Railton warehouse, Chicago.

400 tons, substations, West side development program, New York.

275 tons, sewer, Westchester county sanitary commission, N. Y., general contractor; bids in.

250 tons, Mercy hospital, Davenport, Iowa.

245 tons, five bridges, route 4, section 3, Bergen county, N. J.; bids March 9.

233 tons, four bridges, route 4 section 4, Arcola to the Hackensack river, Bergen county, N. J.; bids March 2.

230 tons, highway, route 47, sections 1a and 2a, Millville to Hunters Mill, Cumberland county, N. J.; bids March 2.

225 tons, highway, route 47, section 3a, Hunters Mill to head of river, Atlantic, Cumberland and Cape May counties, N. J.; bids March 2.

215 tons, sewerage plant, Norristown, Pa.; Seeds & Derhan, Philadelphia, awarded general contract.

210 tons, bridge, Hackensack river, route 4 sections 3 and 4, Bergen county, N. J.; bids March 2.

150 tons, woman's hospital, Philadelphia; bids open Feb. 25.

130 tons, highway, route 1, section 6, Fletcher avenue to Lemoine avenue, Fort Lee, Bergen county, N. J.; bids March 2.

100 tons, woodworking shop, marine barracks, South Broad street, Philadelphia.

Unstated tonnage, film laboratory and sound-proof studio, Culver City, Calif., for Metro-Goldwyn-Mayer Corp.; general contract to Austin Co., Cleveland.

Scrap Institute Still Opposes Percentage Rates

Opposition to a mileage freight rate based on the iron and steel articles rate is being continued by the Institute of Scrap Iron and Steel Inc., New York. Tendency by the interstate commerce commission seems to be toward such a solution of rates on scrap and the institute is taking every means to avoid what it regards as an inequitable basis for rates.

There is some reason to believe the carriers may propose a mileage scale for scrap iron based upon 70 per cent, pig iron upon 80 per cent and billets upon 90 per cent of the iron and steel articles rate.

A subcommittee is to be appointed to co-operate with local units in conferring with the carriers on rate revision matters which may be affected by the general pending situation.

Holland Furnace Co., Holland, Mich., reports net sales for 1930 slightly behind the $18,671,828 volume of 1929, but much ahead of the previous year, according to early estimates.

May Honor Scrap Institute

The Institute of Scrap Iron and Steel Inc., New York, is one of 13 trade associations being considered for the award for 1930 of the American Trade Association Executives. This award, in the form of a medal, is given to the trade association which has rendered the most constructive piece of work to the industry which it represents, to industrial development at large, and to the public.

Delays Tariff Hearing

Washington—The tariff commission has postponed its hearing on agricultural hand tools from March 3 to May 12.

The commission has extended its investigation of steel pens to include pens made wholly or in part of other metal.

General Electric Rewards Workers for Ingenuity

Awards of merit, consisting of certificates and money, are being made this week to 38 employes of the General Electric Co., whose ideas and ingenuity have contributed to progress and efficiency of the company. The awards are made from the Charles A. Coffin foundation, established eight years ago as a memorial to the company's first president. Seven of the recipients this year are shop workmen.

Westinghouse Reduces Work to 5-Day Week

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., will put 18,000 employes on a five-day week basis instead of 5½ days, beginning March 1. Saturday operations will be discontinued, except as required for service to customers and others. The purpose is to spread employment. Salaried employes will be reduced 10 per cent.

Pipe

Northern Natural Gas Co. Will Build 2700-Mile Line—Sales of Cast Fairly Heavy at Chicago

PIPE PRICES, PAGE 93

Pittsburgh—Pipe orders are spotty and usually confined to small lots. The drab outlook in building construction lends a corresponding aspect to the buttweld pipe market, and activity in oil and gas well drilling is providing little demand for tubular material. Most line pipe projects remain in the prospective stage and awards are lacking. The Northern Natural Gas Co. which now is operating nearly 1000 miles of lines in the Southwest and Middle West is planning additional construction which eventually is expected to require about 2700 miles of pipe line.

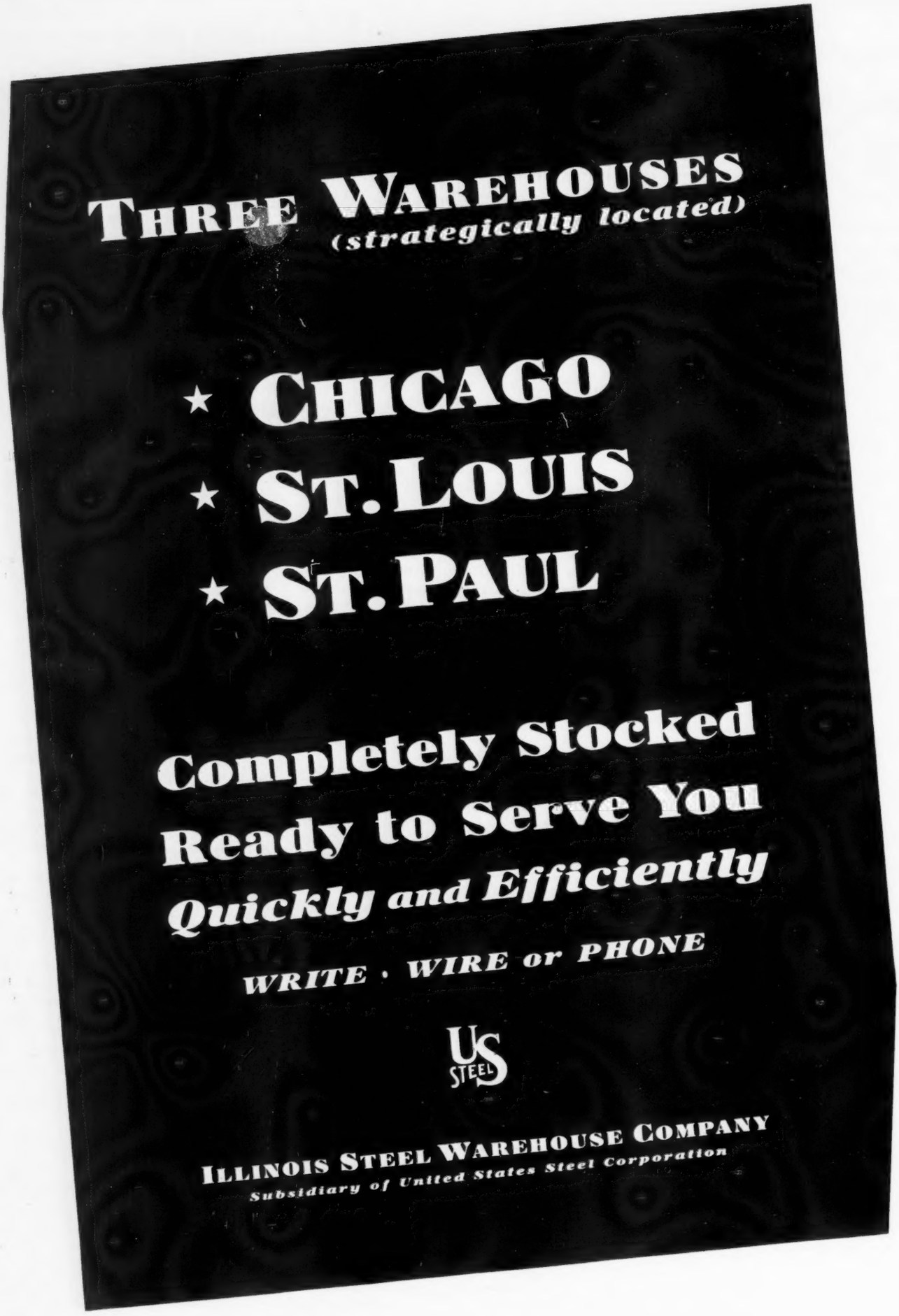
New York—Cast pipe prices are easy at $35, eastern foundry, shading being noted on attractive business. Several foundries are resuming operations in departments that have been down for repairs. City of New York is in the market for 5000 tons, yard stocks, Bronx. Additional inquiry by New York for other yards is expected to follow. Yard stocks are low with the exception of Staten Island. The sewerage disposal plant on Ward's island will take approximately 3700 tons. Two jobs calling for 5000 tons are being readvertised

North Central Gas Co., subsidiary of the New York Oil Co. plans a 400-mile gas line for installation in Nebraska and Wyoming requiring 30,000 tons of steel pipe. Ford, Bacon & Davis Inc., New York, are considering the project.

Boston—Pipe placed in the past week was for 300 tons of 4 and 8-inch gas pipe, awarded by a local utility interest and divided between two manufacturers. The United States Foundry & Pipe Co. is the low American bidder on the 1882 tons of 6 and 10-inch pipe wanted by Pembroke, Mass., while Warren Pipe & Foundry Co. is low for 300 tons wanted by Braintree, Mass. The 2100 tons for Lowell and 200 tons to be taken by Quincy, Mass., are still pending. Prices continue to show firmness.

Cleveland—Jobbers of pipe are not increasing inventories and an occasional carload order is for their depleted stocks. Detroit, which is buying 1275 tons of steel pipe, has received low bids from Biggs Boiler Works Co., Akron, O.; United Welding Co., Middletown, O.; and American Locomotive Co., Dunkirk, N. Y.

Chicago—Detroit has purchased


THREE WAREHOUSES
(strategically located)
★ CHICAGO
★ ST. LOUIS
★ ST. PAUL
Completely Stocked
Ready to Serve You
Quickly and Efficiently
WRITE · WIRE or PHONE
US STEEL
ILLINOIS STEEL WAREHOUSE COMPANY
Subsidiary of United States Steel Corporation

1800 tons of 6 and 8-inch pipe, rejecting the low French bid. Columbus, O., will ask bids shortly on 2000 tons of 16-inch cast and smaller. For private work, the larger diameters are quoted $45.20 to $46.20, delivered Chicago. A few private inquiries are up, and sales in the last few days were 1000 to 1500 tons.

Birmingham, Ala.—Lettings come in from larger cities. Kansas City, Mo., distributed 7178 tons of from 24 to 42-inch pipe with three manufacturers, American Cast Iron Pipe Co., National Cast Iron Pipe Co., and United States Pipe & Foundry Co. Shipments continue active but shops are not yet operating to capacity.

Contracts Placed

7178 tons, 24 to 42-inch, for Kansas City, Mo., 3501 tons to United States Pipe & Foundry Co., Burlington, N. J.; 2952 tons to National Cast Iron Pipe Co. and 725 tons to American Cast Iron Pipe Co., both of Birmingham, Ala.

1800 tons, Detroit, 6 and 8-inch special process pipe to Lynchburg Foundry Co., Lynchburg, Va., and United States Pipe & Foundry Co., Birmingham, Ala.

300 tons, Boston, local utility company split between two unstated interests, 4 and 8-inch gas pipe.

200 tons, 4 to 8-inch, class B, for Aberdeen, Wash., to United States Pipe & Foundry Co., Burlington, N. J., through H. G. Purcell, Seattle.

177 tons, 6 to 24-inch, Hudson, N. Y., to Warren Pipe & Foundry Co., Phillipsburg, N. J.

Contracts Pending

5000 tons, 8 to 20-inch cast iron pipe, yard stocks, Bronx, N. Y.; bids Feb. 24.

3700 tons, up to 20-inch cast iron pipe, sewerage disposal plant, Ward's island, N. Y.

3000 tons, 6 to 12-inch cast iron pipe, for Massapequa, L. I.; readvertised.

2270 tons, 6 and 8-inch, class 150, Los Angeles; bids opened.

2264 tons, 6 and 20-inch, class B, Long Beach, Calif.; bids opened.

2000 tons, 16-inch cast and smaller for Columbus, O.

2000 tons, up to 18-inch, mostly 12-inch cast iron pipe for state hospital, Brentwood, L. I., water system; readvertised.

850 tons, 12-inch cast iron (alternate bids for steel pipe) for Vancouver, B. C.; bids March 9.

765 tons, 4 to 8-inch class C and D, for Burnaby, B. C.; bids Feb. 23.

Steel Pipe Pending

30,000 tons, gas line to be installed between Nebraska and Wyoming for North Central Gas Co. Contract expected to be placed within a week.

1275 tons, Detroit, unstated sizes, United Welding Co., Middletown, O., American Locomotive Co., Dunkirk, N. Y., and Biggs Boiler Works Co., Akron, O., low.

Wire

Better Demand Follows Rains in West—Prices Hold—Second Quarter Inquiry Delayed

WIRE PRICES, PAGE 71

Pittsburgh—Wire business is well sustained, incoming business so far this month comparing favorably with that of January. February ordinarily is a slow month and better business is looked for in March. Specifications for manufacturers' wire show gains in some directions but total business is little changed. No inquiry is appearing for second quarter, with the market currently steady at $1.90 and $2 for wire nails, 2.20c to 2.30c for plain wire and $35 for wire rods.

Chicago—Moderate gains in jobber orders of common wire products have developed, following more rainfall in several farm areas. Conditions have improved in the Northwest. Dealers are moving little material from shelves. Electrical wire activity has been stimulated slightly by the copper advances. Prices are nominal at $1.95 to $2, Chicago or western mills, for wire nails, and 2.25c to 2.35c for plain wire.

New York—Wire specifications are coming through on schedule on contracts, and in an increased volume on new business. Notwithstanding reported shading in some districts, wire is firm here at 2.20c, Pittsburgh. Pending more active construction, nail business is unchanged, with the market at $1.90, Pittsburgh, to jobbers, and $2 to the general trade.

Cleveland—Country wire jobbers continue with an occasional fair-sized order on products such as fencing, though large buying is lagging from hesitation relative to immediate farmer purchasing power. Orders from the manufacturing trade are on a 2.20c, Cleveland, base for plain wire. Nails are unchanged at $1.90 a keg. Report is current that a rise in wire rods from the present $35 level may be expected before March 1. Second quarter books have not been opened officially by sellers in this district and there is little interest in forward buying.

Worcester, Mass.—Production is maintaining a slightly higher rate, though manufacturers are slow to accept the upturn as permanent. Prices are stable, the current quotation on plain bright wire to dealers remaining at 2.40c, base, Worcester.

Fluorspar Sells at $14

Fluorspar Prices, Page 82

Pittsburgh — Fluorspar has declined $1.50 to $2 a ton on a recent sale of a substantial tonnage of the 85 and 5 per cent grade at $14, mines. A purchase at this figure was made by a nearby consumer.

Bolt, Nut, Rivet Trade Is Quiet and Unchanged

Bolts, Nuts, Rivets Prices, Page 71

Pittsburgh — Specifications for bolts, nuts and rivets are quiet and unchanged. Orders from jobbers are lighter than a month ago and demand from railroads and structural shops also lacks improvement. Prices are steady at 73 off for bolts and nuts and 2.75c for large rivets.

Philadelphia—Bolts and nuts are fairly steady with eastern producers at about 35 per cent of capacity. Cruiser No. 37, awarded to the New York Shipbuilding Co. will require substantial quantities over an extended period. It is thought the builder may supply some of its own requirements.

Cleveland—Bolt and nut shipments have improved over January. Production at local plants is now over 50 per cent. Jobbers specify with improved commitments. Prices are unchanged at 73 off list for machine and carriage bolts; rivets are steady at 2.75c, Cleveland.

Chicago—Producers of bolts, nuts, and rivets are increasing operations slightly to 40 to 45 per cent. Moderate gains in automotive work and steady miscellaneous orders keep specifications at about the same volume as in January. Implement buying lags. Discounts for bolts and nuts are unchanged, while the price for large structural rivets, owing to light building demand, remains nominal at 2.85c, Chicago. Indications are that March business will gain.

Steel Aids Ventilation

New York—Air-conditioning of railroad passenger cars, now being tried on the Baltimore & Ohio and Santa Fe railroads, involves the use of several hundred pounds of metal per car, including wrought iron pipe, castings, copper pipe, brass fittings and valves. By this system, similar to the "manufactured weather" of buildings, car windows need not be opened summer or winter.

Raw Material Prices

Pig Iron

Per Gross Ton

FOUNDRY, NO. 2

Chicago furnace	$17.50
Pittsburgh, district fur.	17.00 to 17.50
Pittsburgh, delivered	17.63 to 18.13
Valley, furnace	16.50 to 17.00
Cleveland fur., local del.	17.50
Philadelphia, delivered	17.76
Virginia, furnace	17.75
Granite City, Ill., fur.	17.50
Buffalo, fur., local del.	17.50
Buffalo, del. Boston	21.41 to 21.91
Buff., all-rail, Brooklyn	19.91 to 20.91
Buff., all-rail Newark	18.28 to 18.78
Ala., Bir. fur., local del.	13.00 to 13.50
Alabama, del. Chicago	17.01
Alabama, del. St. Louis	14.92 to 15.42
Alabama, del. Cincinnati	14.69 to 16.19
Ala., Phila., dock del.	15.75 to 16.25
Ala., Balt., dock del.	15.50 to 16.00
Ala., Balt., dock del.	15.50 to 16.00
Alabama, New York dock	16.00 to 16.50
Ala., Boston dock del.	16.25 to 16.75
Tenn., Bir. base, local del.	14.00
Tennessee, del. Cinn.	14.69 to 16.69
Montreal, delivered	23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur., local del.	18.00
Buff., all-rail, Brooklyn	20.41 to 21.41
Buffalo, all-rail Newark	18.78 to 19.28
Buffalo, del. Boston	21.91 to 22.41
Virginia furnace	18.25
Eastern, del. Phila.	18.26

FOUNDRY, NO. 1X

Buffalo fur., local del.	19.00
Eastern, del. Phila.	18.76 to 19.26

MALLEABLE

Valley furnace	17.00 to 17.50
Cleveland fur., local del.	17.50
Pittsburgh dist. fur.	17.50 to 18.00
Pittsburgh, delivered	18.13 to 18.63
Chicago, furnace	17.50
Buffalo fur., local del.	18.00
Eastern Penna., delivered	18.26 to 20.91
Granite City, Ill., fur.	17.50
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh dist. fur.	17.00 to 17.50
Pittsburgh, delivered	17.63 to 18.13
Eastern Penn., del.	17.25 to 17.75
Buffalo fur., local del.	17.00
Montreal, delivered	20.50
Valley furnace	16.50 to 17.00

BESSEMER

Valley furnace	17.00 to 17.50
Pittsburgh, delivered	18.13 to 18.63
Pittsburgh, furnace	17.50 to 18.00

LOW PHOS.

Valley fur., standard	27.00
Philadelphia, standard	24.76 to 27.79
Copper-bear., E. Pa. fur.	22.50 to 23.00

GRAY FORGE

Valley furnace	16.00 to 16.50
Pittsburgh district fur.	16.50 to 17.00
Pittsburgh, delivered	17.13 to 17.63

CHARCOAL

Lake Superior, del. Chi.	27.04

SILVERY

Jackson County, O., fur., in per cents 6—$21; 7—$21.50; 8—$22; 9—$22.50; 10—$23; 11—$24; 12—$25; 13—$27.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents 10—$25; 11—$26; 12—$27; 13—$29; 14—$31; 15—$33; 16—$35.

Coke

Prices Per Net Tons
Beehive Ovens

Connellsville furnace	$2.50
Connellsville foundry	3.25 to 4.85
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

By-Product Foundry

Newark, N. J., del.	9.00 to 9.40
Chicago ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham, ovens	5.00
Indianapolis, del.	8.25
Ashland, Ky., ovens, Connell., basis	5.50
Portsmouth, O., ovens, Connell., basis	5.50
Buffalo ovens	8.00 to 8.50
Detroit, ovens	8.50
Philadelphia, del.	9.00

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports	
Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES
Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%, contract	10.00
Copper-free low phos. 58-65%	nom.

FOREIGN ORE
Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-10% manganese	10.00
North African low phosphorus	9.00
Swedish basic, 65%	9.00
Swedish low phos.	10.00
Spanish, North African basic, 50 to 60%	9.00
Newfoundland fdy., 55%	9.00
Tungsten, spot and future short ton unit, duty paid	$11.25 to 12.50
Chrome ore, 48% net ton c.i.f.	$21.50 to 22.00

Manganese Ore

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55% (nom.)	26 to 28 cents
South African, 52-53%	24 to 26 cents
Indian, 48-50%	nom.
Brazilian, 46-48% (nom.)	23 cents

Refractories

FIRE CLAY BRICK
Per 1000 f.o.b. Works
First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	$43.00
Georgia, Alabama	40.00 to 47.00

Second Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	35.00 to 38.00
Georgia, Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham, Ala.	50.00 to 51.00

MAGNESITE BRICK
Per Net Ton

9 x 4½ x 2½	$65.00

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore bases	40.00
Domes, Chewelah, Wash., base	22.00

CHROME BRICK

Net ton, Chester, Pa., and Baltimore base, 9 x 4½ x 2½	45.00

Semifinished Steel

PRICES PER GROSS TON

BILLETS AND BLOOMS
4 x 4-inch base

Pittsburgh, open-hearth	$30.00
Pittsburgh, bessemer	30.00
Youngstown	30.00
Cleveland	30.00
Philadelphia	35.30 to 36.30
Chicago	31.00
Forging, Chicago	36.00
Forging, Pittsburgh	36.00
Forging, Philadelphia	40.30 to 41.30

SHEET BARS

Pittsburgh	30.00
Youngstown	30.00
Cleveland	30.00
Chicago	31.00

SLABS

Pittsburgh	30.00
Youngstown	30.00
Cleveland	30.00

WIRE RODS

Pittsburgh, Cleveland	35.00
Chicago	36.00

SKELP

All grades, Pittsburgh	1.60c

Ferroalloys

(In dollars, except Ferrochrome)

*Ferromanganese, 78-82%, tidewater, duty paid	$85.00
*Ferromanganese, del. Pittsburgh	89.79
Spiegeleisen, 19-20%, domestic fur. spot†	30.00
Ferrosilicon, 50 per cent, freight all., c. l.	83.50
Do, less carload	88.50
Do, 75 per cent	130.00 to 150.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., con., del.	11.00
Do, for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.10 to 1.15
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producers' plants, net ton	160.00
Do, one-ton to c. l.	170.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic per ton carload, 23-25% f.o.b. Anniston, Ala., 24%	122.50

†Carloads. Differentials apply to large quantities.

*To users of carloads to 550 tons annually. Differentials apply to users of larger quantities.

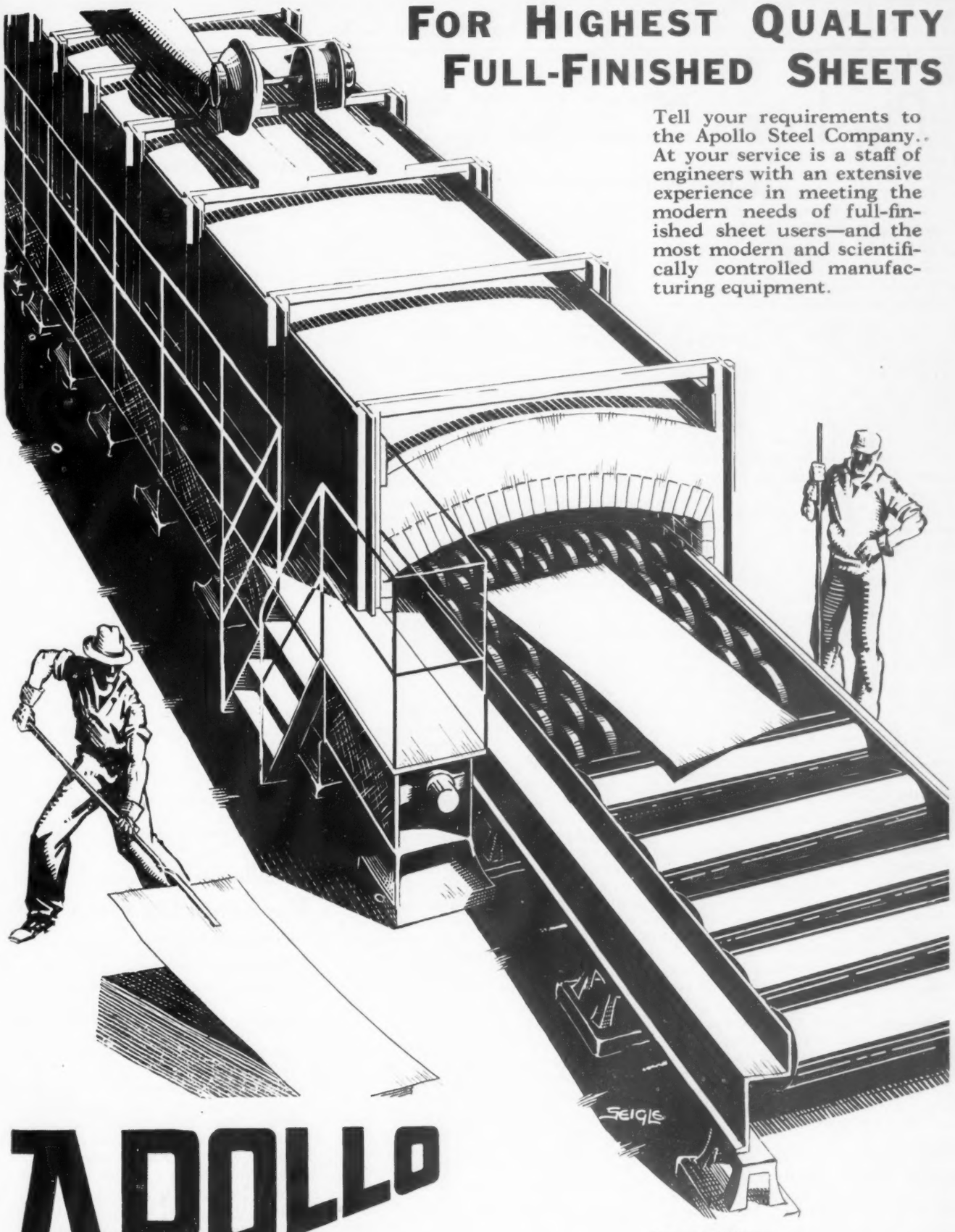
Fluorspar

85 and 5 per cent grade

Washed gravel Kentucky and Illinois mines, per net ton	$14.00
Washed gravel, import duty paid east, tide, gross ton	19.00 to 19.50

FOR HIGHEST QUALITY FULL-FINISHED SHEETS

Tell your requirements to the Apollo Steel Company.. At your service is a staff of engineers with an extensive experience in meeting the modern needs of full-finished sheet users—and the most modern and scientifically controlled manufacturing equipment.



APOLLO STEEL COMPANY

General Offices: APOLLO, PA.

Pittsburgh Office: Oliver Bldg.

Branch Offices:

BOSTON.....250 Stuart St.
BUFFALO.....Marine Trust Bldg.
CHICAGO.....180 N. Michigan Ave.
CLEVELAND
.....1655 Union Trust Bldg.
CINCINNATI...1002 American Bldg.
DETROIT.....2034 Dime Bank Bldg.
INDIANAPOLIS... 508 Illinois Bldg.
LOS ANGELES.....Orpheum Bldg.
LYNCHBURG.....612 Krise Bldg.
NEW ORLEANS....437 Decatur St.
NEW YORK
.....1372 Hudson Term. Bldg.
PHILADELPHIA.....607 Otis Bldg.
SAN FRANCISCO. Monadnock Bldg.
ST. LOUIS.....2817 Laclede Ave.
SYRACUSE.....Hills Bldg
SEATTLE.....2712-4th Ave. South

Pig Iron

Valley and Pittsburgh Prices Down 50 Cents—Other Districts Steady—Sales Lighter

PIG IRON PRICES, PAGE 82

Pittsburgh—Continued quietness in the pig iron market has led to more pronounced price weakness and with sales becoming more general at 50 cents below recent levels quotations now are more representative at $16.50 to $17, base, valley, for No. 2 foundry and basic, and $17 to $17.50 for bessemer and malleable. The basic price still is nominal with sales light, and some sellers are willing to take tonnage at less. Shipments continue slightly ahead of the January rate while new business lacks improvement. Orders are limited in size and number.

Boston—Pig iron sales increased substantially to 5500 tons in the past week. The Mystic Iron Works, Everett, Mass., booked 4700 tons. The Rhode Island Malleable Works, Hills Grove, R. I., purchased 700 tons. Buffalo furnaces are reported to have named lower prices than formerly on inquiries from this district.

New York—Following two fairly active weeks pig iron demand has fallen off, total sales in the past week aggregating 6000 tons of which more than two-thirds went to one seller. New inquiry is light. Prices are easy, with the $15 minimum base on Buffalo iron applying generally throughout this district. Southern iron prices are steady.

Philadelphia—Sales have improved moderately, though individually small. While No. 2 foundry iron is unchanged at $17.76, Philadelphia, No. 1X has settled to $18.76 to $19.26. The Washington navy yard is inquiring for 225 tons of low phosphorus iron. Standard low phosphorus iron now is $24.76 to $27.79, Philadelphia.

Buffalo—Buying has fallen off after some fair size purchases. Inquiry is smaller than at the beginning of the month, and not sufficient to test prices. Four furnaces continue in production, representing about 25 per cent of theoretical capacity.

Youngstown, O.,—The winter lull in blast furnace operation in this district has resulted practically in the disappearance of pig iron stocks here. This applies to steelworks and merchant stacks. Special grades are an exception, having moved more slowly. One merchant furnace company whose stocks have been cleaned up contemplates relighting its stack in the spring. Current sales continue small. No. 2 foundry is $17, valley, and malleable is $17.50, though lower prices are reported as having been made for shipment to outside district.

Cleveland—New business in the pig iron market has flattened out again. Furnace interests with headquarters in Cleveland booked approximately 9000 tons in the past week, less than half the amount they closed in the week preceding. Output for the first quarter is fairly well covered, and delivery on some of the recent orders will extend into the second quarter. Small lots for prompt shipment predominate. Shipments are steady, at a higher daily average than in January. The market in Cleveland is nominal at $17.50, base, while lake furnaces generally obtain $16 to $17, base, for delivery in western and southern Ohio, northern Indiana and southern Michigan. Southern iron is $10.50, base, furnace, equivalent to $16.51, delivered.

Cincinnati—Sentiment in the pig iron market here is improved as the foundry melt has turned upward. Sales during the past week totaled about 3000 tons. Prices are steady.

Chicago—Several pig iron orders are being closed for second quarter at $17.50, furnace, for the base grade, the same as the current price. The recent spurt in buying has subsided and sales for the second quarter so far have been restricted to lots of 500 to 1000 tons. Deliveries continue to gain over January rate. Little improvement is noted at implement foundries. Southern iron is quoted $11, base, Alabama furnace. Efforts are being made to hold silicon differentials on souehern iron.

St. Louis—For the first time in many months there are definite indications of improvement in the pig iron market. New sales in the past week total 10,000 tons. February shipments will exceed those of January, despite the fewer number of days. Prices are firmer, as evidenced by the fact silicon differentials are not being waived as formerly.

Birmingham, Ala.—Production and shipments are increasing. Furnaces are reducing their stocks and are reported to be shading $13 and $14, base, in local territory, though some makers claim to be holding to $14.

Toronto, Ont.—Demand for pig iron continues to increase gradually. Algoma Steel Corp., Sault Ste. Marie, Ont., has blown in its No. 4 stack, making four active in Canada.

Ferroalloy Demand Gains; Foreign Spiegeleisen Easier

Ferroalloy Prices, Page 82

New York—Domestic spiegeleisen, 19 to 21 per cent, appears steady at $30, furnace, in carloads, but foreign offerings are unsettled. Officially, the market on foreign spiegeleisen, 26 to 28 per cent, is $34, duty paid, Baltimore, but substantial shading is noted. Each transaction appears to be a matter of individual negotiation. That the domestic market has not been affected to any extent is attributed partially to the fact foreign offerings are relatively small, with importations light. Approximately 200 tons was imported in November and December. Specifications are more liberal. This also applies to ferromanganese, which is holding at $85, duty paid, in carloads.

Several hundred tons of foreign spiegeleisen has been placed by a wheel manufacturer for various plants for delivery over the next few months, at prices under the domestic.

Pittsburgh — Specifications for ferromanganese and spiegeleisen show little change although the trend gradually is upward. Shipments are slightly heavier than a month ago. The spot market is quiet, with prices steady at $103.79, delivered, for ferromanganese and $30, furnace, for spiegeleisen.

Semifinished Orders Lag; Shipments Hold Gains

Semifinished Prices, Page 82

Pittsburgh—A slight improvement in shipments of semifinished steel over a month ago is not matched by a definite upturn in new business. Orders continue in small lots, with little interest shown in future requirements. Strip mills are running better but sheet producers show little change in their semifinished needs. Rerolling billets, sheet bars and slabs are $30, Pittsburgh, with forging billets usually quoted $36, and wire rods $35.

Youngstown, O. — Consumers of billets, slabs and sheet bars continue to buy sparingly. Wire rods are fairly active. With 30 independent open hearths active this week out of 51, operations are at 59 per cent. Billets, slabs and sheet bars are $30, Youngstown and Pittsburgh, and wire rods are $35, Pittsburgh and Cleveland.

Scrap

Further Weakness Evident as Buying Fails to Develop—Some Quotations Are Lower

Chicago—Heavy melting steel has dropped 25 cents, to the 1921 low, and a number of open hearth, cupola and rolling mill grades are down 25 to 50 cents. This easiness follows the recent strict limitations on shipments by several larger melters. The reductions came in the face of a purchase of about 5000 tons of melting steel in the open market by a large user at Gary, such purchases ordinarily having a marked stabilizing effect. Entrance of Gary into the market probably prevented more drastic cuts, and it is pointed out that purchasing of a larger tonnage by that melter actually might have strengthened some grades. Besides heavy melting steel and several foundry grades, rail ends, shoveling steel, open hearth turnings, No. 1 railroad wrought, and a few

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated.

HEAVY MELTING STEEL

Birmingham	9.50 to 11.00
Boston, dealers	6.75 to 7.00
Buffalo, No. 1	10.75 to 11.25
Buffalo, No. 2	9.25 to 9.75
Chicago	9.75 to 10.25
Cinci., deal.	9.50 to 10.00
Cleve., No. 1	10.00 to 10.50
Cleve., No. 2	9.75 to 10.00
Det., No. 1 deal.	9.50 to 10.00
Det., No. 2 deal.	7.00 to 7.50
E. Pa. del. mill	10.00 to 11.00
N. Y. del. R. R.	7.00
N. Y. deal. No. 2	5.50
N. Y., deal. yd.	5.00
Pitts., No. 1	12.50 to 13.00
St. L. No. 1 sel	10.50 to 11.00
Federal, Ill.	9.25 to 9.75
Granite C., Ill.	9.00 to 9.50
Valleys, No. 1	12.00 to 12.50

COMPRESSED SHEETS

Buffalo, dealers	9.25 to 9.75
Chicago	8.25 to 8.75
Cleveland	9.00 to 9.25
Detroit, dealers	9.50 to 10.00
E. Pa. new mat	9.00 to 10.00
Pittsburgh	12.75 to 13.25
Valleys	12.00

BUNDLED SHEETS

Buffalo	7.00 to 7.50
Cinci., deal.	8.75 to 9.25
Cleveland	7.00 to 7.25
Eastern Pa.	9.00
Pittsburgh	11.50 to 12.00
St. Louis	5.50 to 6.00

SHEET CLIPPINGS LOOSE

Chicago	5.00 to 5.50
Cincinnati	5.00 to 5.50
Detroit, dealers	6.00 to 6.50
St. Louis	5.50 to 6.00

STEEL RAILS SHORT

Birmingham	12.00 to 12.50
Boston, dealers	5.50 to 7.00
Buffalo	13.75 to 14.25
Chicago (3 ft.)	11.25 to 11.75
Chicago (2 ft.)	12.00 to 12.50
Cinci., deal.	15.50 to 16.00
Detroit, deal.	12.50 to 13.00
Pitts. (open-hearth, 3 ft. and less)	14.50 to 15.00
St. Louis	13.00 to 13.50

STOVE PLATE

Birmingham	8.00 to 8.50
Boston, con.	8.00 to 8.50
Buffalo	9.50 to 10.00
Chicago, net	7.75 to 8.25
Cinci., deal. net	5.25 to 5.75
Det., net, deal.	6.25 to 6.75
Eastern Pa.	9.00 to 9.50
N. Y., deal. mill	4.75
St. Louis	8.00 to 8.50

COUPLERS, SPRING

Buffalo	13.50 to 14.00
Chicago	12.00 to 12.50
Eastern Pa.	16.50
Pittsburgh	16.00 to 16.50
St. Louis	11.00 to 11.50

ANGLE BARS—STEEL

Chicago	11.00 to 11.50
St. Louis	9.50 to 10.00

LOW PHOSPHORUS

Buff., billets and bloom crops	15.00 to 15.50
Cleveland bil. and bloom crops	16.50 to 17.00
Eastern Pa.	17.00
Pittsburgh billet bloom crops	17.50 to 18.50
Pitts. sheet bar crops	16.50 to 17.00

FROGS, SWITCHES

Chicago	10.50 to 11.00
St. Louis	10.25 to 10.75

SHOVELING STEEL

Chicago	9.75 to 10.25
Cleveland	6.50 to 7.00
St. Louis	9.50 to 10.00

RAILROAD WROUGHT

Birmingham	9.50 to 10.00
Boston, dealers	8.00 to 8.50
Buffalo, No. 1	8.50 to 9.00
Buffalo, No. 2	10.75 to 11.25
Chicago, No. 1	9.00 to 9.50
Chicago, No. 2	9.75 to 10.25
Cinci., No. 2	9.50 to 10.00
Eastern Pa.	12.50 to 13.50
N. Y., No. 1 deal.	10.00 to 10.50
Pitts., No. 2	12.50 to 13.00
St. Louis, No. 1	7.50 to 8.00
St. Louis, No. 2	9.25 to 9.75

SPECIFICATION PIPE

Boston	6.50 to 7.00
Eastern Pa.	11.50 to 12.00
N. Y., deal.	7.25 to 7.50

BUSHELING

Buffalo, No. 1	9.25 to 9.75
Chicago, No. 1	8.00 to 8.50
Cinn., No. 1 dl.	8.00 to 8.50
Cinn., No. 2	4.50 to 5.00
Cleve., No. 2	6.00 to 6.25
Det., No. 1 new deal.	8.25 to 8.75
St. L., No. 1	7.00 to 7.50
Val. new No. 1	11.00 to 11.50

MACHINE TURNINGS

Birmingham	7.00 to 8.00
Boston, dealers	2.00 to 2.50
Buffalo	6.00 to 6.50
Chicago	4.25 to 4.75
Cinn., deal.	4.50 to 5.00
Cleveland	4.75 to 5.25
Detroit	4.50 to 5.00
Eastern Pa.	7.00 to 7.50
N. Y., deal.	3.00
Pittsburgh	7.50 to 8.00
St. Louis	4.00 to 4.50
Valleys	8.50 to 8.75

BORINGS AND TURNINGS For Blast Furnace Use

Boston	2.00 to 2.60
Buffalo	6.75 to 7.25
Cinn., deal.	4.50 to 5.00
Cleveland	6.50 to 7.00
Detroit, deal.	5.50 to 6.00
Eastern Pa.	6.00 to 7.00
N. Y., deal.	3.00
Pittsburgh	7.50 to 8.00

CAST IRON BORINGS

Birming., chem.	12.50 to 13.00
Birming., plain	7.00 to 8.00
Boston, chem.	9.10 to 9.60
Boston, deal.	2.00 to 2.50
Buffalo	6.75 to 7.25
Chicago	4.50 to 5.00
Cinn., deal.	4.50 to 5.00
Cleveland	6.50 to 7.00
Detroit, deal.	5.25 to 5.75
Eastern Pa.	7.00 to 7.50
E. Pa., chem.	13.50 to 14.50
N. Y., deal.	3.50
Pittsburgh	7.75 to 8.25
St. Louis	6.50 to 7.00

PIPE AND FLUES

Cinn., deal.	7.50 to 8.00

RAILROAD GRATE BARS

Buffalo	7.25 to 7.75
Chicago, net	7.00 to 7.50
Cincinnati	7.00 to 7.50
Eastern Pa.	9.00 to 9.50
N. Y., deal.	6.00
St. Louis	7.50 to 8.00

FORGE FLASHINGS

Boston, deal.	5.50 to 6.10
Buffalo	9.00 to 9.50
Cleve. ov. 10 in.	8.00 to 8.50
Detroit	8.00 to 8.50

FORGE SCRAP

Boston, del.	5.25 to 5.75
Chicago	13.50 to 14.00
Eastern Pa.	11.00

ARCH BARS, TRANSOMS

Chicago, net	11.50 to 12.00
St. Louis	11.50 to 12.00

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	10.50 to 11.00
Chi., steelworks	7.50 to 8.00
Cleveland	8.00 to 8.50
Eastern Pa.	11.00
Pittsburgh	11.00 to 11.50
St. Louis	7.50 to 8.00

STEEL CAR AXLES

Birmingham	14.00 to 14.50
Boston, ship. pt.	14.00 to 15.00
Buffalo	15.50 to 16.00
Chicago	14.00 to 14.55
Eastern Pa.	18.50 to 19.50
St. Louis	14.50 to 15.00

SHAFTING

Bos., ship. pt.	13.00 to 13.50
Chicago	12.90 to 13.45
N. Y., deal.	13.00 to 14.00
St. Louis	12.00 to 12.50
E. Penna.	18.00

CAR WHEELS

Birming., iron	10.00 to 11.00
Boston, iron	14.00 to 14.50
Buffalo, iron	13.00 to 13.50
Buffalo, steel	13.50 to 14.00
Chicago, iron	10.75 to 11.25
Chi., roll steel	13.50 to 14.00
Cincinnati, iron	10.50 to 11.00
E. Pa. steel	15.50 to 16.00
E. Pa. iron	13.50 to 14.00
Pitts., iron	13.50 to 14.00
Pitts., steel	16.00 to 16.50
St. Louis, iron	10.00 to 10.50
St. Louis, steel	13.00 to 13.50

NO. 1 CAST SCRAP

Birming., cup.	9.50 to 10.00
Buffalo (meak.)	10.50 to 10.75
Boston, textile	9.00 to 9.50
Chicago, mach.	10.65 to 11.20
Chi., railroad	10.10 to 10.65
Chicago, agri.	9.50 to 10.10
Cinn., mach. cup., gross	13.50 to 14.50
Cleve. cupola	12.00 to 12.50
Det., net deal.	8.50 to 9.00
E. Pa. cupola	13.00
N. Y. cup. deal	8.00 to 8.50
N. Y., del. local foundries	12.00
Pitts., cupola	12.50 to 13.00
San Fran., del.	13.50 to 14.00
Seattle	8.50 to 9.00
St. L. No. 1 ma	9.75 to 10.25
St. L. No. 1	9.00 to 9.50

HEAVY CAST

Boston	10.50 to 11.00
Bos. mach. cast	11.50 to 12.50
Buffalo, break	7.00 to 7.50
Cleve., break	6.50 to 7.00
Detroit, auto, net deal.	10.50 to 11.00
Det., break., dl.	6.50 to 7.00
Eastern Pa.	11.00
N. Y. No. 1 dl.	8.00 to 8.50
N. Y. break. dl.	7.00 to 7.50
Pittsburgh	10.00 to 10.50

MALLEABLE

Boston R. R.	13.00 to 13.50
Buffalo	12.00 to 12.50
Chicago, agri.	10.50 to 11.00
Chicago, R. R.	12.00 to 12.50
Cinn., R. R. dl.	12.00 to 12.50
Cinn., agri., dl.	12.00 to 12.50
Cleve., rail	12.00 to 12.50
Det. auto deal.	11.00 to 11.50
St. Louis, rail	10.50 to 11.00

RAILS FOR ROLLING
5 feet and over

Birmingham	11.25 to 11.50
Boston	8.50 to 9.00
Buffalo	10.25 to 10.75
Chicago	12.00 to 12.50
Eastern Pa.	13.00 to 13.50
New York	9.00 to 9.50
St. Louis	11.00 to 11.50

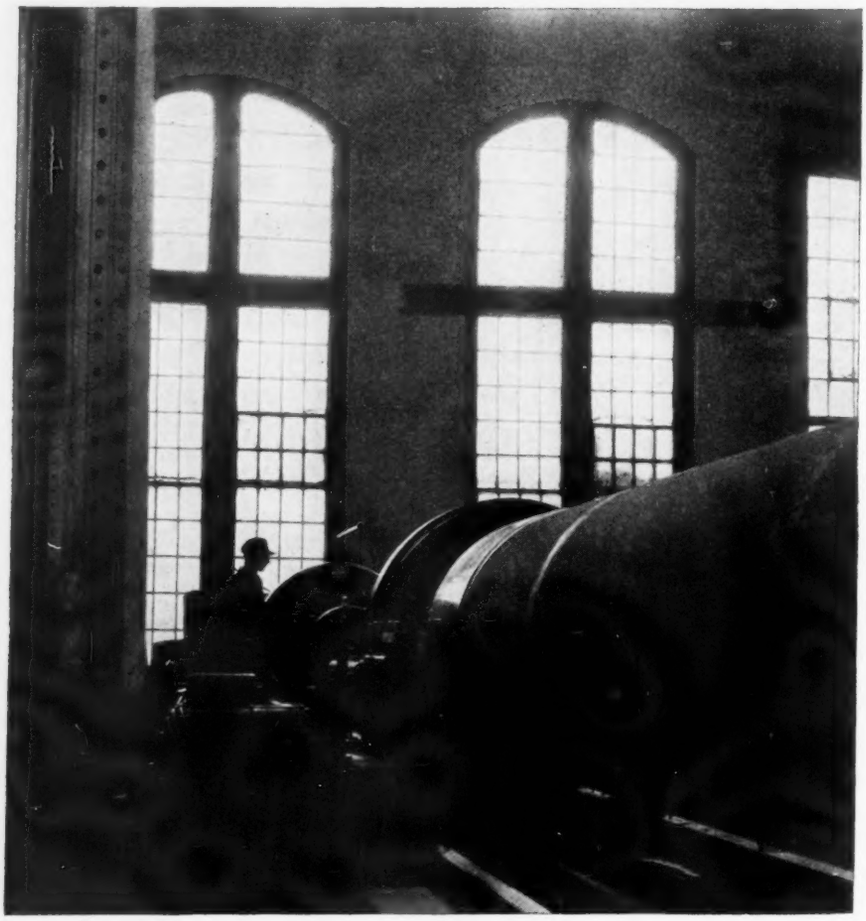
LOCOMOTIVE TIRES

Chicago, cut	13.00 to 13.50
St. L. No. 1	11.00 to 11.50

LOW PHOS. PUNCHINGS

Chicago	11.00 to 11.50
Buffalo	14.00 to 14.50
Eastern Pa.	15.50 to 16.50
Pittsburgh	15.50 to 16.00

MIDVALE TOOL STEEL



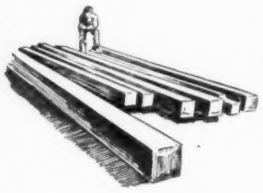
TESTED UNDER THE MOST EXACTING CONDITIONS ANY STEEL CAN BE ASKED TO MEET

Midvale tool steel has been made with just one purpose—to meet the requirements of Midvale shop operation. But what a requirement that is! Gigantic pressure vessels, heavy ordnance of the toughest metal, locomotive wheels whose composition is actually that of tool steel itself—steel of every variety of alloy, work from heavy roughing to that calipered to the ten thousandth of an inch—all this is daily going through the Midvale shops—*and must go through on schedule.* For Midvale has the same problems of delivery, the same problems of economical shop operation that confront you.

And Midvale can supply promptly a tool steel that meets any special shop requirement.

Call on The Midvale Company at any of its offices—Philadelphia, New York, Washington, Pittsburgh, Cleveland, Chicago or San Francisco.

Midvale does not follow the "tonnage" method of tool steel production. Midvale charges with cold metal. Lets the ingots cool, to permit inspection for faults. Carefully chips out any cracks. Reheats ingots and reduces to billet size. Sand-blasts the scale. Again inspects and chips when necessary. Reheats and rolls to finished size. This is the only method by which tool steel of Midvale quality can be produced.



BILLETS

Just as Midvale Tool Steel must meet the most exacting requirements in Midvale's own shops — Midvale Billets must meet the same test. Not simply the ability to produce billets of any size or formula—but to make billets to meet our own severe forging requirements. No forging can be any better than the billet from which it starts.

FORGINGS

Midvale is a "custom shop"—where practically every forging and casting problem a steel man can meet has been met. Midvale melters, forgers, heat-treaters are men experienced in producing those forgings where every square inch of cross-section must do its full duty.

specialties succumbed to the onslaught of short offerings. Melting steel now is quoted at $9.75 to $10.25, the top of the recent spread being maintained. Dealers are able to buy orders at the bottom of the spread.

Boston—Lack of activity leaves the steel and iron scrap market in a nominal position, both as to local demand and shipments outside New England. Some grades are lower because of accumulations.

New York—Dealers' buying prices are unchanged. The market is not subject to much test, mills taking carload lots as needed in most cases. Bethlehem Steel Co. is reported to have bought several thousand tons of No. 1 railroad steel at $10, delivered, Bethlehem, Pa. Mill stocks, as a rule, are not large. A few sales are noted of lots ranging from 200 to 250 tons.

Philadelphia—Steel and iron scrap is quiet and prices unchanged, though sentiment is easier. Railroad wrought is an exception. This grade, which has been holding largely nominal, recently established $11, delivered on sales of 200 tons to a local consumer. While most $9.50 stove plate on $9.50 contracts has been delivered the price still is $9.50 delivered. Business in the steel and heavier grades is negligible.

Buffalo—The steel and iron scrap market has been dull and featureless with no new sales and with many contracts nearly filled. Weakness of heavy melting steel in other markets has checked what looked for a time like a stronger condition locally. Bethlehem Steel Co. has placed a further small tonnage of No. 1 railroad steel at $11, deliveerd.

Pittsburgh—Steel and iron scrap is slightly more active and moderately stronger in some grades. Heavy melting steel buying is confined to one small lot of special nature, leaving the market unchanged at $12.50 to $13. Hydraulic compressed sheets are up 25 cents at $12.75 to $13.25 on substantial sales to one consumer. Machine shop turnings are up sharply at $8 after being nominal for several months. Heavy cast is lower on a sale at $10.

Cleveland—Iron and steel scrap quotations continue nominal, due to continued lack of activity in trading. The embargo on scrap shipments by local mills, instituted several weeks ago, continues and is expected to last for at least another month. Foundry consumption of scrap is considerably below normal. Movement to the Warren, O., consumer continues in fair volume. Youngstown mills, however, are taking only a few cars weekly. Heavy melting steel has been reduced 50 cents a ton to $12 to $12.50 in the valleys. Turnings are quoted fractionally higher.

Cincinnati — Although nominally unchanged, prices of steel and iron scrap were somewhat weakened by bids for recent railroad lists, and by failure of demand to hold. Some miscellaneous buying is being done, with only fair shipments on orders.

St. Louis—Purchasing of steel and iron scrap is slow and the trend of prices is lower, with specific cuts on several grades. Most items are quiescent, however, with quotations purely nominal.

Offerings by railroads continue in considerable volume, but in some instances bids are being rejected, sellers considering them too low. Due to low prices the roads are disposing of only what they are obliged to in order to conserve space.

Birmingham, Ala. — While no signs of further weakness are apparent, improvement in steel and iron scrap is lacking. Heavy melting steel is finding a little demand. Prices are unchanged, with heavy melting steel maximum at $11.

Toronto, Ont.—Some improvement in steel and iron sales has developed. Most of the improvement, however, is in iron grades, with machinery cast and malleable scrap leading. Stove plate and most other lines have failed to fall in line. Mills are still out of the market and the demand for steel scrap is negligible. Prices are unchanged.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron axles	$11.00
Steel axles	10.00
Car wheels	8.00
Stove plate	8.00
Wrought pipe	2.00
Turnings	2.00
Heavy melting steel	6.00

TORONTO

Steel axles	7.00
Iron axles	7.00
Heavy melting steel	7.00
Turnings	2.00
No. 1 mach. cast (net)	9.00
Malleable (net)	7.00

Standard Is Distributed

Washington—The division of simplified practice, department of commerce, is distributing simplified practice recommendations pertaining to full disk buffing wheels. The division observes that at the October, 1929, conference, it was unanimously adopted that the standing committee give consideration to the question of kinds of cloth in sewing and also to such other items as arbor holes and piece buffs.

Coke

Distress Sales of Beehive Furnace Fuel Made at $2.40—Demand Shows Little Change

COKE PRICES, PAGE 82

Pittsburgh — Recent changes in beehive coke demand have been influenced mainly by the weather. Industrial and domestic requirements for heating fuel have increased moderately but consumption for metallurgical purposes is little altered. Furnace fuel continues dull with the market usually $2.50, and occasional distress sales at $2.40. Foundry coke demand is steady at unchanged prices.

Boston—Contract shipments are more than sufficient to provide foundries with coke requirements.

New York—Foundry operations still are around 45 per cent and demand for coke continues restricted. Beehive furnace coke is $2.50 to $2.60, Connellsville, Pa. Standard beehive foundry coke is $3.50 to $3.75, Connellsville, and premium brands $4.70 to $4.85, Latrobe, Pa. By-product coke is $9 to $9.40, Newark, N. J.; $11, New England; and $9, Philadelphia.

Cincinnati—By-product coke dealers are noting recession in demand for domestic grades. Specifications for foundry coke are unchanged.

Chicago—By-product foundry coke shipments are gaining slowly. The price is nominal at $8, ovens.

St. Louis—Coke demand is quiet, with shipments to consumers since Feb. 1 barely maintaining the January average. New orders are for small lots for immediate delivery. The movement to the West and Southwest is the smallest for this period in many years.

Birmingham, Ala. — By-product coke plants are increasing operations, the current rate being the highest in four months. Prices are steady.

Pacific Coast

Light Trading Prevails with Prospects of Better Demand Soon—Track Accessories for Rail Extension Needed—Irrigation Project Requires Plates —Building Tonnage Light

Seattle—Steel markets in the Pacific Northwest have developed no unusual activity but considerable business is pending and conditions appear to be slowly improving. Prices are unchanged in this district, it being the general opinion that reduced levels would not increase turnover.

Bars, Plates and Shapes

Demand for steel bars, both merchant and reinforcing, is slow, recent awards being confined to car lots. Several tonnages are pending but probably total less than 2000 tons. Merchant bars are unchanged at 2.25c and reinforcing at 2.30c. No important specifications are up for figures. It is reported that the Great Northern railroad will shortly be in the market for a considerable tonnage of tie-plates, frogs and other accessories required for the Klamath Falls, Oregon, extension. Railroad inquiry, however, is not up to normal.

Coast Pig Iron Prices

Utah basic	$22.00 to 24.00
Utah foundry	22.00 to 24.00
*German	24.25
*Indian	22.00 to 24.00

*C.i.f. duty paid.

The largest pending job involving plates is an irrigation project near Chelan, Wash., which will require about 1300 tons. Bids will be asked as soon as the bonds are sold. Revised plans have been prepared for a 24 and 36-inch steel water pipe for Seattle and bids will be received Feb. 20. About 300 tons are involved. No awards over 100 tons were reported this week.

Approximately 925 tons of structural steel are involved in the contract awarded the Western Bridge Co. Ltd., Vancouver, B. C., for the frame work on the Canadian National Steamship Co.'s pier in that city. Portland Bridge Co., Portland, Oreg., received the contract for a federal aid project highway bridge in Montana on a bid of $288,985, involving an unstated tonnage of shapes. Bids will be opened Feb. 25 for a 225-foot steel span bridge in Mt. Baker forest reserve, Washington, calling for 125 tons of shapes.

Finished Materials Dull

Wholesale jobbers find trade lagging and confined to small orders. Price schedules are unchanged. No item is in particular demand. Sheets are moving slowly and the month's turnover thus far has been a disappointment. Spring buying is expected to develop shortly.

Hofius Steel & Equipment Co., Seattle, has furnished 50 tons of 90-pound new steel rail for track extensions at the site of the new Ford assembly plant, Seattle. Isaacson Iron Works, Seattle, has the award to furnish the city with a McCormick-Deering type gasoline driven rail car for the lighting department at $1,960. Seattle has also purchased 200 steel car wheels from the Pacific Coast Steel Corp., Seattle, at $29.50 per wheel and 2-inch hub brass trolley wheel castings from the Harbor Island Brass Foundry, Seattle, at 24 cents per pound. Portland has received bids for furnishing 56 tons of special castings, low tender by Wood-Ewing Iron Works, Portland, at $5,712.

Pipe Needs Are Light

U. S. Pipe & Foundry Co., through its Northwest agent, H. C. Purcell, Seattle, has booked 200 tons of 4 to 8-inch cast iron pipe for Aberdeen, Wash. Seattle water department is preparing preliminary plans for an extension of 12 and 16-inch water mains in suburban territory north of the city. Other municipal improvements in Seattle are to be up for figures soon. W. A. Sheppard, city purchasing agent, Vancouver, B. C., will receive bids March 9 for furnishing about 850 tons of 12-inch cast iron or steel pipe. Arthur G. Moore, city clerk, Burnaby, B. C., will open bids Feb. 23 for supplying about 765 tons of 4 to 8-inch cast iron mains. Several municipal projects involving cast iron pipe are in prospect.

Contract for furnishing 736 miles of transmission wire, 2400 tons for Seattle's Diablo-Skagit electric power line, was awarded this week to the Aluminum Co. of America, through San Francisco headquarters, on a low bid of $737,155. The only other bid was submitted by the Anaconda Wire & Cable Co., at $912,961.

To carry this line, the city will shortly receive bids for fabricating and erecting steel towers, involving about 5500 tons of shapes. Specifications are not yet prepared.

Old Materials

There is little change in the steel and iron scrap markets. Prices are weak and probably as low as they have ever been in this territory. Local mills are paying $8 to $9 gross for either kind of scrap, best grades, but one lot was recently taken at $7.50 gross ton, f.o.b. mill.

Rail Tonnage Is Up

San Francisco—(*By Air Mail*)—Awards of steel products this week were not heavy, and few new inquiries of importance came up for figures. The outstanding new inquiry involves 10,350 tons of 110-pound rails for the Western Pacific Co., San Francisco, bids on which have been opened. The Southern Pacific Co. has placed 1300 tons of track spikes with unnamed interests.

Bars, Plates and Shapes

Awards of concrete aggregated less than 500 tons and brought the total for the year to 8046 tons as compared with 6066 tons for the corresponding period in 1930. The only lettings of importance involved 200 tons for a school in Los Angeles and 100 tons for an arsenal in Hawthorne, Nev., both placed with unstated interests. No change has occurred recently in warehouse prices in the San Francisco and Los Angeles districts, 2.50c, base, on carload lots being firm. Merchant bar steel is moving in small lots only and on this class of material 2.15c, to 2.25c, c.i.f. prevails.

Demand for plates is practically at a standstill and no new inquiries in excess of 100 tons developed this week. Prices range from 2.05c, to 2.15c, c.i.f.

Structural shape lettings were 4755 tons, bringing the total for the year to 13,845 tons, compared with 14,357 tons for the same period last year. Bids have been opened on 154 tons for a subway in Santa Ana, Calif., and bids will be opened Feb. 20 for 110 tons for a bridge near Hackberry, Ariz. San Francisco will open bids Feb. 25 for 300 tons for a bridge over Islais creek. Plain shapes range from 2.15c, to 2.25c, c.i.f.

Other Finished Material

Bids have been opened on 2270 tons of pipe for Los Angeles, and 2264 tons for Long Beach, Calif.

Steel, Wrought and Cast Iron Pipe, and Tubing

Welded Iron, Steel Pipe

Base Price $200 Ton

Base Discounts on steel pipe, Pittsburgh and Lorain, O., to jobbers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del., 2½ points less. Wrought iron pipe, Pittsburgh base.

BUTT WELD

Steel In.	Blk.	Gal.	Iron In.	Blk	Gal.
⅛	58	44½	⅛	23	5
¼	62	50½	¼	28	11
1—3	64	52½	1 and 1¼	31	15
			1½ and 2	35	18

LAP WELD

2	57	45½	2	23	9
2½—6	61	49½	2½—3½	28	13
7—8	58	45½	4—6	30	17
9—10	56	43½	7 and 8	29	16
11—12	55	42½	9—12	26	11

BUTT WELD

Extra strong, plain ends

½	55	44½	¼ & ⅜	+13	+48
¾	60	49½	½	23	7
1—1½	62	51½	¾	28	12
2—3	63	52½	1—2	34	18

LAP WELD

Extra strong, plain ends

2	55	44½	2	29	13
2½—4	59	48½	2½—4	34	20
4½—6	58	47½	4½—6	33	19
7—8	54	41½	7 and 8	31	17
9—10	47	34½	9—12	21	8
11—12	46	33½			

To large jobbers these discounts on steel pipe increased on black by 1 point and two discounts of 5 per cent; on galvanized by 1½ points with two 5 per cents. On iron pipe large jobbers obtain additional discount of 1 point with 5 and 2½ per cent on black and galvanized.

BOILER TUBES

Carload Discounts, Lap Welded Steel		f.o.b. Pittsburgh Charcoal Iron	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¼—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron. Smaller quantities subject to following modifications from base discounts.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Charcoal Iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

COLD DRAWN

1	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Tubing

Cold drawn; f.o.b. mill

Random lengths over 5 ft. 55%
Selected lengths, 1 to 18 ft. 53%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

Six-inch and over, Bir.....$37.00 to 38.00
Four-inch, Birmingham..... 41.00 to 42.00
Four-inch, Chicago ..... 49.20 to 50.20
Six to 24-inch, Chicago..... 45.20 to 46.20
Six-inch and over, N. Y..... 37.50 to 39.50
Four-inch, New York..... 40.50 to 41.50
Stand. fittings, Bir. base.... $100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher. Class A pipe $4 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

STEEL BARS

Baltimore	3.00c
Boston	3.265c
Buffalo	3.15c
Chattanooga	3.10c
Chicago	2.90c
Cincinnati	3.15c
Cleveland	2.85c
Detroit	3.00c
Houston	3.00c
Los Ang.	3.40c
New York‡(d)	3.10c
Philadelphia	2.60c
Pittsburgh	2.75c
Portland	3.15c
San Frans.	3.40c
Seattle	3.15c
St. Louis	3.15c
St. Paul	3.00c
Tulsa	3.65c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.15c
Chattanooga	3.10c
Chicago	3.00c
Cincinnati	3.15c
Detroit	3.00c
New York‡(d)	3.10c
Philadelphia	2.60c
St. Louis	3.15c
Tulsa	3.65c

REINFORC. BARS

Baltimore	2.50c-3.31c
Boston	3.265c
Buffalo	2.95c
Chattanooga	3.10c
Cincinnati	3.15c
Cleveland	2.25c-2.44c
Detroit	3.00c
Houston	3.00c
Los Ang. cl.	2.40c
Los Ang. lcl.	2.70c
New York	2.65c-3.10c
Phila.	2.40c-3.00c
Pittsburgh	2.75c
San Fran. cl.	2.80c
San Fran. lcl.	2.60c
Seattle	3.15c
St. Louis	3.15c
Tulsa	3.65c
Young.	2.30c-2.60c

SHAPES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	3.25c
Los Ang.	3.40c
New York(d)	3.10c
Philadelphia	2.50c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	3.75c

PLATES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Clev., 3/16-in.	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.40c
New York(d)	3.30c
Philadelphia	2.50c
Phila. floor	5.10c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	2.75c

NO. 10 BLUE

Baltimore	3.50c
Bost. 3/16-in.	9.915c
Buffalo	3.50c
Chattanooga	3.60c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.10c
Detroit	3.35c
Houston	3.90c
Los Ang.	3.95c
N. Y. (d)	3.00c-3.40c
Portland	4.00c
Phila.*†	3.05c
Pitts.**	2.75c
San Fran.	3.80c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.40c
Tulsa	3.95c

NO. 24 BLACK

Balt.*†	3.50c
Boston	4.70c
Buffalo	4.20c
Chicago	3.80c
Cincinnati	4.05c
Clev.***	3.75c
Detroit	3.75c
Los Ang.	4.70c
New York	3.50c-3.65c
Phila.*†	3.60c
Pitts.**	3.40c
Portland	4.50c
San Fran.	4.35c
Seattle	4.50c
St. Louis	4.05c
St. Paul	3.545c
Tulsa	4.10c

NO. 24 GAL. SHEETS

Balt.*†	4.00c
Boston	5.45c
Buffalo	4.40c-4.60c
Chicago (local del.)	4.35c
Chicago (outside)	4.35c-4.60c
Cincinnati	4.90c
Cleveland***	4.35c
Detroit	4.25c
Houston	5.40c
Los Ang.	5.10c
New York	4.00c-4.10c
Phila.*†	4.15c
Pitts.**	4.00c
Portland	5.00c
San Fran.	5.00c
Seattle	5.00c
St. Louis	4.60c
St. Paul	4.23c
Tulsa	4.60c-4.75c

BANDS

Baltimore	3.50c
Boston	4.015c-5.00c
Buffalo	3.50c
Chattanooga	3.30c
Chicago	3.10c
Cincinnati	3.35c
Cleveland	3.10c
Det. 3/16-in. & lighter	3.30c
Houston	3.65c
Los Ang.	4.30c
New York(d)	3.40c
Philadelphia	2.90c
Pittsburgh	3.10c
Portland	3.50c
San Fran.	3.75c
Seattle	4.15c
St. Paul	3.75c
Tulsa	3.85c

HOOPS

Baltimore	3.50c
Boston	5.50c-6.00c
Buffalo	3.90c
Chicago	3.65c
Cincinnati	3.90c
Cleveland	3.65c
Det. No. 14 & lighter	3.80c
New York	3.75c
Philadelphia	3.15c
Pittsburgh	4.10c
Seattle	5.15c
St. Paul	3.70c

COLD FIN. STEEL

Rounds & Hexagons

Baltimore (c)	3.30c
Boston	3.50c
Buffalo	3.15c
Chattanooga*	3.85c
Chicago	3.35c
Cincinnati	3.80c
Cleveland	3.40c
Detroit	3.65c
Los Ang. (a)	4.50c
New York	3.50c
Philadelphia*	3.40c
Pittsburgh	3.35c
Portland (a)	4.50c
San Fran.(a)	4.25c
Seattle (a)	4.75c
St. Paul (a)	3.85c
St. Louis	3.60c
Tulsa	4.75c

Flats and squares 5½c extra, except Tulsa, where 5.14c is quoted. (a) Rounds, hex. only.

COLD ROLL. STRIP

Boston 0.100 in., 500 lb. lots	5.30c
Buffalo	5.65c
Chicago (soft) (b)	6.15c
Cincinnati	6.10c
Clev. (b)	5.95c
Detroit	5.40c
Phila. (c)	4.85c
New York	5.05c

(b) Net base straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
‡Domestic bars.
*Plus quantity extras.
**Less than 25 sheets.
*†50 or more bundles.
***Less 0.15c where more than 10 bundles are ordered at once for delivery at one time.

MACKINTOSH HEMPHILL ROLLS

Reliability

Service

MACKINTOSH-HEMPHILL COMPANY

ESTABLISHED 1803 AT PITTSBURGH

PIONEERS — ENGINEERS — BUILDERS

General Offices:
POINT BUILDING—PENN AVENUE AT WATER STREET,
PITTSBURGH, PA.

GARRISON DIVISION, PITTSBURGH, PA.
MIDLAND DIVISION, MIDLAND, PA.
WOOSTER DIVISION, WOOSTER, OHIO.

Mill Products

Base price cents per pound f.o.b. mill, except otherwise specified. Copper and brass product prices based on 10.00c, Conn., for copper

Sheets	
Yellow brass (high)	17.12½
Copper, hot rolled	19.75
Lead, full sheets (cut ½c more)	8.50
Zinc sheet (100-lb. base)	9.50
Tubes and Pipes	
Seamless yellow brass (high)	22.00
Seamless copper	22.12½
Rods	
Yellow brass (high, full turnings)	15.37½
Naval brass	16.37½
Anodes	
Copper, untrimmed	17.25
Wire	
Yellow brass (high)	17.62½

Old Metals

Dealers' buying prices, cents lb.

Heavy Red Brass	
New York	6.75 to 7.00
Chicago	6.50 to 6.75
Cleveland	7.00 to 7.50
St. Louis	6.75 to 7.00
Heavy Yellow Brass	
New York	4.50 to 4.75
Heavy Copper and Wire	
New York	7.50 to 7.75
Boston	7.25 to 7.50
Chicago	7.25 to 7.75
Cleveland	7.25 to 7.50
St. Louis	6.50 to 7.00
Red Brass Borings	
New York	6.25 to 6.75
Yellow Brass Tubing	
Cleveland	4.25 to 4.50
Light Copper	
New York	6.75 to 7.00
Chicago	6.25 to 6.50
Cleveland	6.25 to 6.50
St. Louis	6.50
Light Brass	
Boston	3.50 to 3.75
Chicago	3.75 to 4.25
Cleveland	3.50 to 3.75
St. Louis	3.75 to 4.00
Zinc	
New York	2.00
Cleveland	1.50 to 1.75
St. Louis	2.00
Aluminum	
Clippings, soft, Cleveland	12.00 to 13.00
Clippings, hard, Cleveland	8.50 to 9.00
Borings, Cleveland	4.50 to 5.00
Mixed cast, Cleveland	5.50 to 6.00
Mixed cast, Boston	4.00 to 4.50
Mixed cast, St. Louis	4.25

Secondary Metals

Remelt aluminum No. 12	11.00 to 12.00
Brass ingots, 85-5-5-5	10.00

Quicksilver $104-105

New York—Quicksilver is quiet at $104 to $105 a flask.

Metals

Copper Demand Increases and Prices Pick Up—Lead Is Firm But Zinc Quotations Ease Off

New York—Business in nonferrous metals improved in the past week, with the exception of zinc. The latter lost its recent gain in price, due to lack of demand, while in copper and lead the market appeared more encouraging to sellers. Copper recovered ½-cent sharply.

Consumption of metals shows no decided changes at any point. Brass and copper mill products and brass ingot prices have been marked up to the basis of copper at 10.00c. The increases in these materials have ranged mostly ⅜ to ½-cent.

Copper—After custom smelters had cut the price to 9.50c, Connecticut, nearly two weeks ago, interest revived on account of the extremely low price and custom smelters soon became reluctant sellers. At the 10-cent level, other producers came back into the market when custom smelters turned away business, and this action ended the price recovery. It was generally believed that this action by the producers was helpful, as the market showed signs of getting into a runaway. January statistics showed a continued decrease in stocks, so that with 11,000 tons cut off in January, stocks are about 30,000 tons less than the peak reached last autumn. Production continues to be curtailed further. Total stocks of copper were 574,000 tons, of which over 364,000 tons were refined.

Zinc—Prime western is easy at 4.00c, East St. Louis, with demand lacking. This situation reflects the similar condition in galvanized sheets. Metal can be had at this price into April delivery. On account of the low price smelters show much resistance when the market gets around 4.00c, as it has on several occasions in the past few months.

Tin—Business has been done in the past week on spot and futures, with the former quoted mostly a little under 26.00c. There has been little real change in this market for many weeks. Stocks continue to accumulate for the world as a whole, but mostly in England. Prices are kept from going lower by the resistance that sellers show to the extremely low level.

Lead—Lead was much more active last week for prompt and March shipment. Practically all classes of users were in the market. Prices are firmer but unchanged.

Aluminum—Prices are unchanged, but some grades of remelt metal are somewhat firmer. New business continues light.

Coke By-Products More Active; Benzol Firmer

New York—Benzol is slightly firmer with an increase in buying. Toluol, having slipped to 29.00c, holds at that figure with little change in demand. Xylol and solvent naphtha, drifting in sympathy with toluol, are unchanged. Coke oven operations continue far below normal. Several distributors expect a shortage in toluol before the end of the year is available stocks are being gradually reduced. There is some increase in spot volume in sulphate of ammonia while shipments against contracts are holding well. Sulphate of ammonia is now being based at $1.85 to $1.90, Atlantic and Gulf ports, per 100 pounds, the market being easy at these quotations.

Coke By-Products

Per Gallon, Producers' Plants, Tank Lots

	Spot
Pure benzol	$0.20
90 per cent benzol	0.20
Toluol	0.29
Solvent naphtha	0.25
Commercial xylol	0.25
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.16 to 0.17
Per Pound at Producers' Plants	
Naphthalene flakes	3.75 to 4.75
Naphthalene balls	4.75 to 5.75
Per 100 Pounds Atlantic Seaboard	
Sulphate of ammonia	$1.85 to $1.90

Prices of the Week, Cents a Pound

	——Copper——			Straits Tin New York		Lead	Lead East	Zinc	Alum-inum		
	Electro delivered	Lake de-livered	Casting refinery	Spot	Futures	N. Y.	St. L.	St. L.	98-99%	Spot Antimony	Ingot Nickel
Feb. 11	10.00	10.12½	9.75	26.25	26.62½	4.50	4.30	4.00	22.90	7.02½	35.00
Feb. 12—Holiday											
Feb. 13	10.00	10.12½	9.75	25.75	26.12½	4.50	4.30	4.00	22.90	7.05	35.00
Feb. 14	10.00	10.12½	9.75	25.62½	26.00	4.50	4.30	4.00	22.90	7.05	35.00
Feb. 16	10.00	10.12½	9.75	25.80	26.12½	4.50	4.30	4.00	22.90	7.10	35.00
Feb. 17	10.00	10.12½	9.75	26.40	26.80	4.50	4.30	4.00	22.90	7.10	35.00

Europe

Depression Now Settling on French Industry — European Markets Dull, Prices Weaker

London—(*By Cable*)—The French iron and steel industry which through the greater part of 1930 seemed to be immune from the depression afflicting other European nations is beginning to feel the full effects of it. STEEL's correspondent at Paris reports conditions are growing worse and unemployment is increasing rapidly. The Belgian and German markets continue stagnant and price concessions are being made to meet foreign and domestic competition.

British prices also are weakening as markets are persistently dull. Continental competition in pig iron in the Midland has been stopped for the present while merchants there report a slight increase in demand for Continental steel. Midland steelworks are greatly in need of orders. Shipyards are inactive. Middlesbrough pig iron producers are feeling competition from the Continent. Exports of galvanized sheets are dwindling and the market for tin plate is weak.

Production of pig iron in Britain in January totaled 337,200 tons, compared with 349,800 tons in December, and 560,000 tons in January, 1930. Stacks in operation Jan. 31 numbered 83, seven more than at the close of December. January steel ingot and castings output amounted to 402,200 tons, against 337,200 tons in December, and 771,100 tons in January, 1930. By coincidence, January pig iron output was the same as December steel production. British iron and steel imports in January amounted to 221,773 tons, compared with 283,038 tons in December. Exports totaled 167,373 tons, against 169,544 tons in December.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Feb. 16	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f.o.b. Ship at Port of Dispatch—By Cable								
PIG IRON		£ s d		£ s d		£ s d		£ s d
Foundry No. 3**.....	$14.22	2 18 6*	$12.64	2 12 0	$12.64	2 12 0	$12.15	2 10 0
Basic-bessemer.....	14.58	3 0 0†	11.91	2 9 0	11.91	2 9 0	13.37	2 15 0
Hematite, Phos. .02-.05	17.01	3 10 0	.....	.....	.....	.....	17.01	3 10 0
SEMIFINISHED STEEL								
Billets.....	$26.73	5 10 0	$17.13	3 10 6	$17.13	3 10 6	$17.50	3 12 0
Wire rods.....	41.31	8 10 0	29.16	6 0 0	29.16	6 0 0	29.16	6 0 0
FINISHED STEEL								
Standard rails.....	$40.10	8 5 0	$31.59	6 10 0	$31.59	6 10 0	$31.59	6 10 0
Merchant bars.....	1.68c	7 15 0	.87c	3 19 6	.87c	3 19 6	.87c	3 19 0
Structural shapes.....	1.68c	7 15 0	.78c	3 10 6	.78c	3 10 6	.79c	3 11 6
Plates.....	1.79c	8 5 0	1.00c	4 11 0	1.00c	4 11 0	1.05c	4 15 0
Sheets, black, 24 gage	1.90c	8 15 0	1.74c	7 18 0	1.74c	7 18 0	1.93c	8 15 0
Sheets, gal., 24 ga. corr.	2.44c	11 5 0	2.27c	10 6 3	2.27c	10 6 3	2.31c	10 10 0
Bands and strips.....	2.06c	9 10 0	1.00c	4 10 6	1.00c	4 10 6	1.01c	4 12 0
Plain wire, base.....	2.06c	9 10 0	1.13c	5 2 6	1.13c	5 2 6	1.18c	5 7 6
Galvanized wire, base..	2.39c	11 0 0	1.49c	6 15 0	1.49c	6 15 0	1.45c	6 12 0
Wire nails, base.....	2.39c	11 0 0	1.16c	5 5 0	1.16c	5 5 0	1.21c	5 10 0
Tin plate, box 108 lb...	$ 3.77	0 15 6	.....	.....	.....	.....	$ 8.26	1 14 0
Domestic Prices at Works or Furnace—Last Reported								
			French Francs		Belgian Francs		Renten Marks	
Fdy. No. 3 Pig Iron**	$14.22	2 18 6	$11.37	290(2)	$13.39	480	$18.54	78
Basic pig iron.....	14.58	3 0 0	12.74	325(1)	12.56	450	20.32	85.50
Furnace Coke.....	2.92	0 12 0	6.19	158	5.02	180	5.09	21.40
Billets.....	27.34	5 12 6	19.21	490	18.00	645	26.27	110.50
Standard rails.....	1.79c	8 5 0	1.41c	785	1.57c	1,210	1.36c	127
Merchant bars.....	1.68c	7 15 0	.97c	540	.93c	715	1.37c	128
Shapes.....	1.90c	8 15 0	1.12c	620	.92c	705	1.34c	125
Plates.....	1.95c	9 0 0‡	1.37c	760	1.10c	845	1.57c	147
Sheets, black, 24 gage	1.90c	8 15 0	2.33c	1,295	2.34c	1,800	1.25c	117
Sheets, gal. 24 ga., corr.	2.39c	11 0 0	2.79c	1,550	2.73c	2,100	3.53c	330
Plain wire.....	2.06c	9 10 0	2.16c	1,200	2.15c	1,650	2.21c	207
Bands and strips.....	2.06c	9 10 0	1.25c	695	1.27c	975	1.58c	148

*Middlesbrough; †Basic; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 12s 0d ($2.92) f. o. b. Ferromanganese £16 9s 0d ($79.95) delivered Atlantic seaboard, duty-paid. German ferromanganese £12 5s 0d ($59.54) f. o. b.; **Silicon 2.50-3.00. British quotations are for basic openhearth steel. French, Belgian, Luxemburg, and German are for basic-bessemer steel.

British Steel Market in Disappointing Situation

London—From the point of view of iron and steel export trade, 1931 has begun in a disappointing manner and hopes entertained in December, when prices tended to rise, have not materialized. In Great Britain recently fair inquiry has come from export markets, and some orders have been placed with the British steelworks by Continental buyers, but, generally speaking, bookings have not come up to expectations. On the other hand, the present level of British pig iron prices has to some extent checked producers of foreign iron, although a substantial tonnage is to be received against old contracts. However, weakening of Continental prices for semifinished and finished steel products is causing uneasiness among British mills. One bright spot in British business is exports of hematite pig iron, shipments to Italian ports having recently improved.

Overseas Interests Place Orders

Some contracts recently have been placed with British engineering firms from overseas markets, among those calling for a substantial tonnage of steel being the following: One 3¼-million-gallon pressed steel tank for the Murree Waterworks, India, placed with Braithwaite & Co. Ltd., London; six engines and tenders for the Peiping-Liaoning railway, China, placed with the North British Locomotive Co. Ltd., Glasgow; a contract for passenger and freight cars for various overseas markets, placed with the Associated Equipment Co. Ltd., Southall; one order for 33 locomotives for Indian railroad companies, placed with the Vulcan Foundry Ltd., Newton-le-Willows. Associated British Machine Tool Makers Ltd., London, has obtained a contract for the supply, on credit terms, of machine tools to the value of £600,000 to the Russian trade delegation over a period of a year.

Reports from France are that domestic trade is rapidly deteriorating and prices are weakening, and it is to be expected the French iron and steel works will begin to show greater interest than in the past for export trade. In view of weakness of prices, they will be well placed to take export orders, although at present demand is somewhat restricted.

In Germany, efforts to fix the ex-

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port price of merchant bars around £4 7s ($21), f.o.b. northern sea ports, seem to have failed, and bars have been selling freely at £4 2s 6d ($19.50) and £4 3s 6d ($20.20). Owing to keen American competition the price of wire rods for the Far East has weakened, and £6 10s ($31.45), c.i.f. Far Eastern ports, has been accepted. Wire nails have been selling at £5 10s ($26.55) and bright wire at £5 7s 6d ($25.75), while galvanized wire has been sold at £6 15s ($32.55) and barbed wire at £9 2s 6d ($44.15). The price for sheets also has been reduced, and 20-gage black sheets have been offered at £6 10s ($31.45), while 24-gage has been quoted at £8 2s 6d ($39.-35).

The situation on the Belgian export market continues unfavorable and the price continues to weaken. However, the level reached is such that only small concessions now are made, and the restriction of output appears to make itself felt. It is believed, however, that underlying conditions in Belgium are healthy, as it is known that world stocks are low and the present level of prices is hardly likely to deteriorate further. A drop of about 1s (24c) in relation to the previous week's prices is registered on most steel commodities.

Belgian Mills Unable To Sell Steel at Any Price

Brussels—The Belgian iron and steel market is weak, and now that the holiday period is over it can be believed that the market is not affected by any outside influences. As a result, it can be said that conditions of the market itself are unsatisfactory and volume of orders is small.

There is no change in pig iron. Foundry pig iron, 2.5 to 3 per cent silicon, is sold at 450 to 500 francs ($16.20 to $18), and for export at about £2 12s ($12.60), f.o.b. Antwerp. Semifinished steel is stagnant and practically no orders have been received, even from Great Britain.

A feature of the present position is that Far Eastern markets are under the influence of fluctuations in the price of silver, and appear to have a tendency to use part of their silver stock by purchasing goods, and at the same time shipping companies have taken advantage of these conditions to try to increase their freight rates, and have been partly successful. As a result some business is being done with China, particularly for discards of semifinished products and bars and for cobbles (discards of wire rods); for the latter product offers range from £2 5s to £2 12s ($10.45 to $12.60), f.o.b. Antwerp, according to section.

Reports from other markets are that buyers find present prices too high for their purchasing power. This, however, sounds a rather poor excuse, as the present price level is lower than at any time, even prior to the war. Merchant bars now are quoted at £4 to £4 1s ($19.40 to $19.60), f.o.b. Antwerp; this compares with £4 2s 6d ($19.95) quoted one week previously. Beams are offered at £3 12s ($17.45), and £3 13s ($17.65) for British sizes. Hoops and bands are quoted at £4 15s ($23), but the market is dull and orders now are being received for 20 or 25 tons at a time, whereas usually they were not less than 100 tons. Five-millimeter plates are quoted at £4 15s ($23) and 3 millimeter sheets at £4 16s ($23.25).

French Find Steel Orders Few and Small; Prices Low

Paris—The French iron and steel market is deteriorating. Orders are decreasing in number and volume, and prices are going down. Producers are anxious to obtain orders and are making concessions to keep operations as near as possible to normal capacity; the price situation is, in fact, becoming confused, and there seems to be no tendency among producers to arrive at a common understanding. There are expectations that a number of important orders will come out in connection with national defensive work, particularly for reinforced concrete bars, but it is not expected these orders will be distributed before summer.

The price of foundry pig iron, 2.5 to 3 per cent silicon, is 290 francs ($11.35) f.o.t. Longwy. The Hauts Fourneaux de Saulnes offer hematite foundry and semi-phosphorus pig iron at the same prices as those fixed by the comptoir. A new ferroalloy has made its appearance on the market; it is produced by the Acieries d'Ugine and is called *le Silicium*. It contains a minimum of 98 per cent of silicon and a maximum of 1 per cent iron. This product is obtained in the electric furnace.

Semifinished steel is dull. The syndicate continues to fix its prices in relation to competition, and orders are scarce. Demand for beams and structural steel is reduced, and jobbers complain that the price of beams, which is fixed by the beams syndicate, is too high, with the result that builders are tending to replace steel beams by wood or reinforced concrete. The official price of beams continues to be fixed at 620 francs ($24.30), which is abnormal when compared with merchant steel, for which the market is free and which sells at 530 to 550 francs ($20.75 to $21.50). The present price shows that the increase in price which gave rise to certain hopes during December 1930, has not materialized.

The market for plates and medium-sized sheets is fairly satisfactory, but lighter gages show a tendency to weaken, and the basis price for light gage sheets now ranges from 860 to 880 francs ($33.60 to $34.50), f.o.t. works. There is a good demand for wire products, and prices are firm. Wire mills have their order books well filled, and, in fact, a number of works in the east of France are refusing orders, as they have reached the quota allotted to them by the existing agreement. Wire nails are quoted at 1350 francs ($34.50) f.o.t. works.

Belgian Trade Is Less

Brussels—Exports of pig iron and other iron and steel products from Belgium and Luxemburg in October fell off from September. Imports of pig iron in October were less than in September, but imports of other iron and steel products increased. Comparisons follow, in metric tons:

	—Imports—		—Exports—	
Mon. ave.	Pig iron	Other iron and steel	Pig iron	Other iron and steel
1927	31,760	28,000	11,350	388,000
1928	45,910	38,000	8,240	380,000
1929	56,150	37,000	10,090	394,500
1930				
Jan.	44,274	37,200	13,551	392,000
Feb.	38,121	32,700	7,320	295,600
Mar.	42,240	29,600	9,412	403,900
April	36,504	26,200	10,624	436,400
May	34,007	28,000	10,266	355,600
June	29,287	28,400	8,410	314,500
July	31,676	23,750	7,876	318,600
Aug.	26,996	20,900	8,196	282,400
Sept.	32,823	22,200	10,014	356,500
Oct.	30,612	26,400	8,963	345,000

French Trade Increases

Paris—Exports of pig iron from France in October and imports into France exceeded those of September. Comparative figures follow, in metric tons:

	—Imports—		—Exports—	
Mon. ave.	Pig iron	Other iron and steel products	Pig iron	Other iron and steel products
1927	3,230	7,440	69,640	404,730
1928	3,365	8,320	52,215	368,410
1929	3,345	15,100	46,760	279,610
1930				
Jan.	11,806	22,374	44,016	259,133
Feb.	20,463	24,965	44,977	297,208
March	16,747	28,024	42,522	269,752
April	15,195	25,347	41,630	277,886
May	15,803	23,020	39,576	263,606
June	12,715	24,261	43,046	291,279
July	10,847	21,167	45,706	207,023
Aug.	11,702	24,323	45,382	273,648
Sept.	8,689	20,915	44,560	235,976
Oct.	10,670	18,251	46,842	265,973

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Machinery

GRADUAL recovery of the machine tool market continues to be the average condition, a fair volume of orders in one district counteracting temporary recessions in another. With orders in most cases covering single pieces of equipment in widely scattered industries, the recent purchase of a considerable amount of equipment by a Cleveland manufacturer of automotive parts is an outstanding and—it is hoped—prophetic event. A peculiarity of such orders as there are is that most of them are for rush delivery. This leads some machine tool plants to jump from part time to overtime, only to revert to lethargy just as suddenly.

New York—Machine tool buying and inquiry, while inclined to be somewhat spotty, on the whole are maintaining the improvement noted in January. The nature of new inquiry is especially promising toward the development of early business. While no large lists are out—with the exception of that of the New Haven railroad, which still is pending—the number of inquiries covering one and two machines is moderately large. Livelier machine tool interest is developing in plants upstate, in southern New England and in northern New Jersey. In some instances machine tool builders have increased working schedules materially. Builders and dealers generally seem more optimistic. Governmental departments continue to inquire for a number of machines in the East.

Grinding machinery volume is better, this applying both to orders and inquiries. Demand is coming from a varied list of industries, interest on the part of automotive accessory manufacturers being particularly marked. Buying for Russia has slowed down after the recent flurry. Ball bearing plants are operating on spotty schedules. Almost without exception current, machine tool orders are for rush delivery and as a result of their spotty character, plants go on overtime only to sink back into lethargy when such orders are completed. Demand for parts is heavier and almost invariably such business also is of a rush character.

Worcester, Mass.—But slight change from the condition reported last week is apparent in the machinery situation. Naturally, there is a continuation of the production activity aroused by the large order for grinders which came from Russia, and by the order for 300 high-speed worsted looms placed by American Woolen Co. with Crompton & Knowles Loom Works.

Both of these orders, which were announced in last week's report, have relieved the unemployment situation to a slight degree and have improved the industrial morale considerably. Otherwise, much quoting is being done by machine builders, but orders, usually for single units, continue to be few and far between.

Pittsburgh—Machine tool sales hold at the slightly improved rate noted earlier in February. Orders still are relatively light but activity has broadened since January, which for some sellers was the poorest month in more than a year. Inquiry shows little change and is confined to small, scattered lots. Railroads are inactive in the market and awards of Westinghouse Electric & Mfg. Co. continue light. Demand from steel mills is spotty.

National Tube Co. has placed three 10 and 15-ton cranes for its McKeesport, Pa., plant, two being awarded to Cleveland Crane & Engineering Co. and one to Harnishchfeger Corp.

Cleveland—The recent purchase of a large amount of equipment by a Cleveland manufacturer of automotive parts is the most important event in local machine tool circles since the first of the year. This is looked upon as a justification of the vigorous sales effort being concentrated upon the automotive industry, and machine tool men expect that it will stimulate further sales.

Aside from this, the pace of business is proving to be somewhat discouraging. Several companies report little or no gain, either in inquiry or orders, during the past week. There also has been a slight set back in general employment. Experienced observers predicted, however, that gradual trade recovery would be punctuated by slight recessions of short duration.

In the meantime at least one of the well known machine tool companies is engaged in overhauling its sales organization, important changes affecting both plans and personnel being underway. With marketing the problem of the hour, much activity of this sort is expected.

Chicago—Industrial inquiry for machine tools is lagging but the Western railroad outlook continues to be a more encouraging factor. No action has been taken on the small number of railroad inquiries before the market, but promise of further lists is being given. Chicago, Great Western has issued a list which will be purchased at once, according to announcement. This includes a 36-inch shaper, two 24-inch lathes, a 5-foot radial drill, a hydraulic bushing press and a number of smaller items.

Light production equipment was the main feature of sales during the week. Only a few of the heavier types of machine tools were placed. While reports of concessions in price are heard in some districts, sales here have not been sufficiently numerous to reveal any definite evidence of price shading. One manufacturer of bandsaws is advancing prices 10 per cent, effective March 1.

Shipment of Cranes Gains as Orders Fall Off

New York—While shipments of overhead cranes increased by five units, new orders and unfilled bookings declined in January, according to the Overhead Electric Crane institute. Shipments totaled 56 units, with a tonnage capacity of 808, valued at $495,561. This compares with 51 units, tonnage capacity 1276, valued at $670,706.68, in December.

New orders in January dropped to 37, with a tonnage capacity of 991, valued at $422,968. In December, new orders totaled 48, tonnage capacity 627, valued at $301,899. This indicates that, while fewer units were ordered the first month this year, such cranes were of larger tonnage capacity, their value being more than $100,000 greater.

Unfilled orders on Feb. 1 were 121 units, tonnage capacity 3329½, valued at $1,407,117. On Jan. 1 unfilled orders were 144 units, tonnage capacity 3427, valued at $1,517,325.25.

Hoist Shipments Increase but Value Declines

New York—Members of the Electric Hoist Manufacturers' association report that the number of hoists ordered during January, 1931, showed an increase of 29.113 per cent as compared with the previous month. The value of such orders is reported to have decreased 8.593 per cent as compared with December, 1930, although shipments were 9.854 per cent greater in January than in December.

Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New England

BOSTON—Bureau of supplies and accounts, navy department, Washington, will receive bids Feb. 24 on schedule 5130 for one electric furnace for toolroom work, for delivery to the navy yard here.

DOVER, MASS.—E. F. Hodgson Co., 1108 Commerce avenue, Boston, is reported to be in the market for an 8-foot power shear for sheet metal work.

SPRINGFIELD, MASS. — United Electric Light Co. is reported to be receiving bids for the construction of a substation to be erected in East Springfield at a cost of approximately $40,000.

WAKEFIELD, MASS. — City commission plans waterworks improvement, including a pumping station. Estimated cost, $40,000. G. A. Packard is a member of the commission.

PRESQUE ISLE, ME.—Bangor & Aroostook railroad, Bangor, Me., plans to rebuild its shops at its engine house here, recently damaged by fire.

PROVIDENCE, R. I.—Autocar Co., Ardmore, Pa., recently noted as building a branch service plant here, advises that the unit will contain 20,000 square feet of floor space. Contractors are Gordon & Gordon, Rhode Island Hospital Trust building, Providence. Equipment needs are undecided. (Noted Feb. 5.)

New York

BINGHAMTON—Ideal Machine Corp. has been incorporated with $10,000 and 1000 common shares by Mangan, Mangan & Mangan, to deal in machinery.

BUFFALO—American Lithographic Co. Inc., with local headquarters at 601 Amherst street, will enlarge its plant here, removing its present New York plant to the local site, which previously had been a branch.

JAMAICA—Hyman's New York & Jamaica Express, 145 101st avenue, proposes to erect a shop at Jamaica avenue and 165th street at a cost of about $40,000. Plans are private.

MINEOLA—Roosevelt Field Inc. advises through George W. Orr, president, that three hangars recently damaged by fire will not be replaced at the present time. (Noted Feb. 5.)

NEW YORK—Midtown Roofing and Sheet Metal Works has been incorporated by J. H. Muson, 25 West Forty-third street, to deal in sheet metal.

NEW YORK—Hunts Point Steel and Iron Works has been incorporated with $10,000 capital by Ort & Forst, 280 Broadway, to engage in construction.

NEW YORK—Bengold Mfg. Co. has been incorporated with $10,000 capital by B. M. Goldberger, 887 East 176th street, to manufacture electrical appliances.

NEW YORK—Plant of the Charles A. Borne Co., electricians and machinists, 476 West Broadway, recently was damaged by fire.

NEW YORK—Jones & Larsen, 58 Fifty-fifth street, Maspeth, Queens, propose to construct a shop at Furman avenue and Grand street, to cost $40,000 with equipment. Structure will be 100 x 100 feet. Plans are private.

NORTHPORT—Long Island Lighting Co., Woodbine avenue, will erect a warehouse. Preliminary plans are being prepared. Bids are due about May 1. Estimated cost, $75,000.

ROME—Adams Foundry Inc. has been organized by Louis J. Schneible, 100 West Pine street, to expand the operations of the Adams Foundry.

Pennsylvania

PHILADLEPHIA—Navy department, Washington, will receive bids Feb. 25 for construction of an engine test building at the navy yard here. Plans are private.

PHILADELPHIA—U. S. department of supplies, Washington, will receive bids March 4 for extension of a shop building here at Fifteenth street and Washington avenue. Structure will be of three stories. Estimated cost, $300,000.

PHILADELPHIA—Bureau of supplies and accounts, navy department, Washington, will receive bids Feb. 24 for delivery to the navy yard here, for one metal cutting band saw, on schedule 5112 and for two high speed sagging grinders, on schedule 5114. Bids will be received, for delivery to the naval aircraft plant, for one electric heat treating furnace, on schedule 5124.

New Jersey

NEWARK—Unique Art Mfg. Co., 196 Waverly avenue, is having preliminary plans prepared by S. Shew & Co., 24 Commerce street, for a 2-story addition. Cost is estimated at $40,000. Company manufactures metal novelties.

RIDGEWOOD — Automatic Appliance Co. has been incorporated with $25,000 capital by Frederick V. Watson, to make fire extinguishers.

UNION CITY—Harry V. Lehman Inc. has been incorporated with $25,000 capital by Corporation Trust Co., 15 Exchange place, Jersey City, N. J., to manufacture electrical apparatus.

Ohio

CINCINNATI — University of Cincinnati, Arthur R. Morgan chairman of the board of trustees, administration building, Clifton avenue, will receive bids in March for a shop and warehouse. Cost is estimated at $100,000. Hunt & Allan, Eagle Savings & Loan building, architects, are preparing plans. Structure will be 56 x 112 feet.

CLEVELAND — Steelweld Machinery Co. has been organized by Cyril J. Bath, East Seventieth street and Machinery avenue, to manufacture and sell buildozers, bending brakes and similar tools, to be built of steel plate shapes, cut out by oxygen acetylene torches and welded into shape by electric arc welders.

CLEVELAND — Odenkirk Motor Wheel Corp., Hippodrome building, has been organized by H. C. Odenkirk, head of the Odenkirk Mfg. Co., manufacturer of railway supplies. Company will establish a plant and start operations in March for the manufacture of a new type of automobile wheel with split rim. W. B. Jameson, formerly associated with the Hydraulic Steel Co., will be general manager.

Indiana

INDIANAPOLIS — Universal Gear Corp., 327 South LaSalle street, Chicago, proposes to open an assembly plant here for the assembly of instruments and parts, including aeronautical products. Lease of 30,000 square feet of plant space is reported.

LAFAYETTE — Purdue university, R. B. Stewart comptroller, will receive bids until March 1 for a power plant addition. Boilers and equipment will be required. W. Scholer, 210 Wallace building, is engineer.

RADNOR—Great American Products Inc. is reported to have been organized here by Ira Fetterhof and William H. Ashba, with $50,000 capital, and to be planning operation of a plant for the manufacture of liquid and vapor control valves and other equipment specialties.

Michigan

BARAGA — Central Public Service Corp. has started construction of a power project on the Sturgeon river at Hersley Rapids, near here. Contract for construction of a 450-foot dam has been let to Price Bros., Dayton, O. Work is directed by Holland, Ackerman & Holland, 53 West Jackson boulevard, Chicago.

DETROIT—Grand River Plating & Mfg. Co., 4414 Grand River avenue, plans operation of a metal works.

Company recently was organized by Vincent B. Arnold, Detroit, and Henry E. Adelsperger Jr., Grosse Pointe, Mich.

FLINT—LaBell Screw Products Co., 5409 South Saginaw street, J. D. LaBell manager, 815 East Patterson street, is a new firm here, manufacturing screws, bolts, and automatic devices.

GRAND RAPIDS—Cox-James Co., 41 Coldbrook street, whose incorporation recently was noted, advises that the company, which manufactures sheet metal products, has a new plant. H. F. Cox is president and L. J. Cox is secretary. (Noted Feb. 12.)

MANISTIQUE—New turbines, electrical equipment, and a 600-pound high pressure boiler plant will be installed by the Manistique Pulp & Paper Co. Bids will be called for soon.

ST. JOSEPH—Skidmore Corp., Vine street, has been incorporated with $25,000 capital by B. Skidmore, St. Joseph, and B. A. Seaburg, Benton Harbor, Mich.

Illinois

BELLEVILLE — Peerless Enameling & Stamping Co., R. G. Willman secretary, has let contract for an addition to be constructed at 1500 West Lincoln street. Unit will be 110 x 120 feet.

CHICAGO—Howe Mfg. Co., 4612 Maypole avenue, has been incorporated with $75,000 capital by Whitman, Miller & Coon, 35 North Dearborn street, to make electrical devices and equipment.

CHICAGO—Carbo-Tet Products Co., room 506, 130 North Wells street, has been incorporated with $30,000 capital by Thomas H. Murray, 130 North Wells street, to engage in a machinery business.

CHICAGO — Standard Floor Machinery Co. has been incorporated with 800 no par shares by Karlin, Cohen & Karlin, 228 North LaSalle street, to manufacture and deal in floor machinery and tools.

CHICAGO—Commonwealth Edison Co., 72 West Adams street, has a building permit for construction of a substation, 74 x 92 feet, at 352 Wenl dell street, at a cost of about $75,000. H. V. Von Horst, 20 North Wacker drive, is architect.

CHICAGO — Automobile Warning Signal Corp. has been incorporated with 400 no par shares by Charles P. Schwartz, One LaSalle building, to manufacture and deal in warning signals.

WAUKEGAN—Board of education proposes to build a vocational training school. Shattuck & Layer, 134 North LaSalle street, Chicago, are architects. Estimated cost, $100,000, with equipment.

Southern States

WILMINGTON, DEL. — Southern Agricultural Tank Line Inc. has been incorporated with $500,000 capital by the Corporation Trust Co. to deal in tank cars and railway supplies.

WASHINGTON—Secretary of the interior will receive bids until March 3 for a turbo-generator set with valves and pumps.

SARASOTA, FLA. — Rhoades & Sons, 416 Main street, are in the market for boilers, pumps and tanks.

NEWNAN, GA.—F. B. Cole, box 563, is inquiring for data on a sandblast machine.

SHREVEPORT, LA.—Bids will be received March 5 by George E. Lamb, construction quartermaster, Commercial Bank building, for construction of a maintenance shop and garage structure at Barksdale field. Cost, approximately $100,000.

SHREVEPORT, LA.—Arkansas Fuel Co. will build two pumping stations in connection with its 8-inch oil pipe line planned to be built from Gregg county, Tex., oil fields near Longview to the local refinery of the Louisiana Oil Refining Corp., an affiliated company. J. H. Mobley, Ardis building, Shreveport, is engineer in charge of construction.

CHARLESTON, MISS. — Machine shop, mill sheds and other units of the Turner, Farber, Love Lumber Co. recently were damaged by fire. Loss is estimated at approximately $200,000.

MARION, N. C.—F. J. Bates, 21 Broad street, Asheville, N. C., is considering establishment of a plant here for the manufacture of sanitary ware.

FURGESON, S. C.—Columbia Railway & Navigation Co., care of Murray & Flood, engineers, 369 Lexington avenue, New York, proposes to develop a hydroelectric project on the Santee river near here.

CLIFTON FORGE, VA. — Iron Mountain Mining & Development Corp., O. J. Graham president, 4700 Connecticut avenue northwest, Washington, developing a mineral deposit near here, will install machinery and equipment.

RICHMOND, VA. — Virginia Electric & Power Co. will expend $26,000 for a booster pump to be installed in the Twelfth street power station.

WESTON, W. VA.—West Virginia Glass Specialties Mo. is reported to plan construction of two additional shops.

Missouri

JOPLIN—Myers Tri-State Supply Co., 501 Wall street, is reported to plan occupation of the Crawford Machine Works plant at 306 Wall street.

ST. LOUIS — Concrete Transport Mixer Co. has been organized to manufacture portable concrete mixers for mounting on trucks. F. H. Fleming, 650 Rosedale avenue, is president.

Arkansas

EL DORADO—City council has ordered survey for location, building and equipment for a municipal airport, to be made by Jones, Roessle, Olschner & Weiner, architects, Ardis building, Shreveport, La.

Oklahoma

CHICKASHA—Badgett Steam Lubricator Co. has been incorporated with $50,000 capital by F. L. Badgett, to manufacture oil field specialties.

DRUMRIGHT—Ideal Machine Works, S. L. Anderson manager, is erecting a shop building, 30 x 90 feet, for repair of oil field engines.

OKLAHOMA CITY — Southwestern Electric Co., 712 North Harvey street, will install a machine shop for repair of electrical equipment. Meadows Stout is manager.

OKLAHOMA CITY — Motor Parts & Machine Co., C. W. Danneburg president, establishing a machine shop at 722 North Harvey street for special automotive machine work, has bought all needed machinery. C. E. Zongker is shop superintendent. (Noted Jan. 22.)

TULSA—Tulsa Park board has engaged Blair Brothers, Exchange Bank building, as architects for a $30,000 hangar unit to be built at the municipal airport.

TULSA—Public Service Co. is reported to plan construction of a substation with capacity of 3000 kilowatts at Eighteenth street and Midland Valley railroad and a 1000-kilowatt substation at Thirty-first street near Riverside drive.

Texas

AMARILLO — American Pipe & Junk Co., T. Specter manager, has increased capital from $10,000 to $30,000 to provide for expansion, including an enlarged pipe machine shop.

DALLAS—National Air Transport Inc., 5936 South Cicero avenue, Chicago, has completed plans for construction of a hangar, 100 x 300 feet, at Love field, here. E. P. Locke is manager of operations in charge.

FT. WORTH—Double Seal Piston Ring Co. has been incorporated with $150,000 capital by R. H. Moore, Burkbennett building, to manufacture piston rings.

LONGVIEW—Southwestern Gas & Electric Co. will enlarge its power plant here to provide for additional oil field operations. E. Q. Whitney is local superintendent.

LONGVIEW—Dixie Gulf Gas Co., subsidiary of the United Gas System, Houston, Tex., will build pumping station and power plant facilities in connection with pipe line extensions in Gregg county oil fields. C. B. Fitze, Rusk building, Houston, is chief construction engineer.

SAN ANTONIO—Central Power & Light Co., Frost National Bank build-

ing, will build several substations and enlarge existing power plants in the Rio Grande valley as a part of an expansion program recently announced

WICHITA FALLS—G. D. Fairtrace, city manager, will receive bids Feb. 24 for construction work on a $1,000,000 waterworks improvement project, to include pumping stations. Montgomery & Ward, Harvey-Snider building, are engineers. Burns & McDonnell, 400 Interstate building, Kansas City, Mo., are consulting engineers.

Wisconsin

BARABOO—County highway commission, William Halbersleben commissioner, has let contract to the Esline Co., Oconomowoc, Wis., for a machinery storage building and service shop, 40 x 100 feet.

LA CROSSE—General Instrument Co., recently organized to manufacture pressure gages, metering devices and other automobile and mechanical equipment, is considering erection of a plant this year. Shop building has been acquired for immediate production. L. A. Corey, 1616 Madison street, is president, and A. H. Zischke is secretary and general manager.

LADYSMITH—Ladysmith Machine Co. has been established here with a shop in the Arndt building by Floyd Prill, formerly of Bloomer, Wis.

MILWAUKEE — Fritzke & Icke Inc., 338 Davidson street, is taking bids for the construction of a 1-story extension, 60 x 80 feet, to the company's machine shop on South Water street, at the foot of National avenue.

MILWAUKEE—School board, William A. Klatte secretary, of Whitefish Bay, a suburb, is having plans prepared by M. Tullgren & Sons Co., architects, 1234 North Prospect avenue, for a new $1,000,000 high school, to include two industrial training shops. Four boilers with oil burning equipment are included in the plans, which will be completed about March 1.

MILWAUKEE — Milwaukee Valve Co., 2375 South Burrall street, in addition to plant extensions now being completed, is considering erection of a new foundry and heating plant, to cost from $75,000 to $100,000. Work will start about June 1, if plans mature. Foundry unit will be equipped with new furnaces and presses to enable company to turn out its own requirements of forgings and hot press work. John Fraser Jr. is president and V. Fina is works manager.

SOUTH MILWAUKEE — Bucyrus-Erie Co., W. W. Coleman president, will install new equipment and machinery and construct a 2-story addition for pattern storage, provided for in a budget allotment of $300,000. Most of the investment will be in the main works here.

TWO RIVERS—City commission is considering erection of a power plant, 50 x 100 feet, with diesel engine units, to cost $240,000. Burns & McDonnell, consulting engineers, 400 Interstate building, Kansas City, Mo. E. J. Donnelly is city manager. (Noted Nov. 13.)

WAUKESHA — Waukesha Pattern Works is to build a 2-story plant, approximately 50 x 100 feet. Frank D. Chase Inc., 720 North Michigan avenue, Chicago, has the general contract.

Minnesota

MINNEAPOLIS — Twin City Machine Co., A. Schneider president, Power bulding, Nicollet island, has awarded contract to Ernest M. Ganley Co., 2922 Oakland avenue, for a 1-story machine shop, 60 x 120 feet, and a 1-story warehouse, 50 x 50 feet, at Sixth street and Second avenue southeast. Cost is estimated at $20,000. Clyde W. Smith, 222 Essex building, is architect.

South Dakota

PIERRE—City council has awarded contract to Henry Carlson Co., Minnehaha block, Sioux Falls, S. D., for a 2-story power plant to cost $60,000. Ray Baker is city engineer.

Iowa

LATIMER—Great Lakes Pipe Line Co. will build a pumping station near here, to cost $100,000. Equipment will include two diesel engines and two booster pumps.

Kansas

GOODLAND—Public Utilities Consolidated Corp. is reported to plan construction of a power plant here, at a cost of approximately $75,000.

Nebraska

GRAND ISLAND—H. E. Clifford, city clerk, will receive bids until March 4 for construction of pump and blower houses. Cost of the project is estimated at $40,000. Black & Veatch, 700 Mutual building, Kansas City, Mo., are engineers.

OMAHA—Superior Road Supply Co. has been organized here, with offices at 1106 Nicholas street, to manufacture corrugated metal culverts.

Colorado

COLORADO SPRINGS — Colorado Natural Gas Co., Independence building, plans to build compressor plants in connection with a proposed pipe line between here and Canon City, Colo. Entire project will cost about $2,500,000.

PUEBLO—Nelson Aircrafts Inc. has been incorporated with $50,000 capital by Wilbur G. Nelson and Henry M. McCarthy, to deal in aircraft.

Montana

FORSYTH—City council will receive bids about April 1 for four pumps each with capacity of 350 gallons per minute, and cast iron pipe. F. F. Palmer is city engineer.

Pacific Coast

ALHAMBRA, CALIF.—City council proposes to build a municipal light and power plant. Burns & McDonnell, 400 Interstate building, Kansas City, Mo., are engineers.

NATIONAL CITY, CALIF.—Magic Way Gas Heating Appliances Inc. plans to erect a 1-story addition. Approximate cost, with equipment, $40,000.

PALO ALTO, CALIF.—City council is considering erection of a municipal light and power plant. Burns & McDonnell, 400 Interstate building, Kansas City, Mo., are engineers.

POMONA, CALIF. — City council proposes to construct an auxiliary pumping station. F. C. Froehde is city engineer.

SACRAMENTO, CALIF.—City council proposes to erect two hangar units at a municipal airport to be developed. Approximate cost, $100,000. Bond issue of $150,000 for the project has been approved.

SAN DIEGO, CALIF.—Bureau of supplies and accounts, navy department, Washington, will receive bids March 3, for delivery to the naval air station here, for one motor-driven hack saw, on schedule 5119; for one shaper machine on schedule 5123, and for one motor-driven universal milling machine, on schedule 5131.

SAN FRANCISCO—G. W. Price Pump & Engine Co., 1350 Folsom street, advises that new structure now being built will add 9500 square feet of shop space. (Noted Feb. 5.)

UPLAND, CALIF.—City council is considering the purchase of pumps as a part of waterworks improvements which will cost $45,000.

PORTLAND, OREG.—Stephen Carver, 174 East Seventy-first street, is in the market for two water wheels and generators.

SEATTLE — Telfer & Buckingham have organized for the purpose of fabricating steel. Plant has been established at 1610 West Hanford street. W. J. Telfer and J. W. Buckingham, formerly associated with the Bacon & Matheson Forge Co., Seattle, are members of the firm.

SEATTLE—Bureau of supplies and accounts, navy department, Washington, will receive bids March 3, for delivery to the naval air station here, for one motor driven cutter machine on schedule 5113; for one motor-driven band saw on schedule 5116; for one motor-driven universal milling machine on schedule 5120; and for one

service test bench, with lathe and attachments, on schedule 5125.

YAKIMA, WASH. — City commissioners will award contract for construction of a $30,000 warehouse to house equipment and repair shops of the street and water departments.

Dominion of Canada

MACCAN, N. S.—Nova Scotia Power Commission, Halifax, N. S., proposes to engage in a power development project here. Cost is estimated at $350,000. H. J. Johnston is engineer.

AYLMER, ONT. — Public utilities commission is in the market for deep well equipment with pump and motor. Dr. F. H. Miller is chairman.

GALT, ONT. — Shurly-Dietrich-Atkins Co. Ltd., formed by the consolidation of E. C. Atkins & Co., Hamilton, Ont., and the Shurly-Dietrich Co. Ltd., Galt, will concentrate operations here. Equipment in the Atkins plant at Hamilton will be moved here. Company manufactures saws. P. G. Dietrich is president and general manager.

HAMILTON, ONT.—Metal Textile Corp. of Canada Ltd., manufacturer of copper wire cleaning utensils, is a new firm here. Company is a branch of the Metal Textile Corp., Orange, N. J.

HAMILTON, ONT.—S. H. Kent, city clerk, will receive bids March 5 for four low lift pumps in connection with construction of a filtration plant. W. L. McFaul is city engineer.

HULL, QUE.—City council has engaged E. B. Eddy Co. Ltd. to prepare plans for a municipal filtration plant. Construction is to start in March. Estimated cost, $250,000.

OTTAWA, ONT.—Canadian Postage Meters & Machine Co. Ltd. has been incorporated with 50,000 no par shares by Ernest G. Gowling, to manufacture and deal in automatic postage meters and vending machines.

TORONTO, ONT.—Aircraft Accessories Co. Ltd. has been incorporated with 40,000 no par shares by Reginald E. Nicoll, to manufacture and deal in aircraft.

TORONTO, ONT.—Canadian Dura Co. Ltd. has been incorporated with 5000 no par shares by Kenneth B. Palmer, to manufacture metal goods, tools and machinery.

TORONTO, ONT.—Advisory vocational committee, board of education, has approved a building program for 1931 which will include construction of an addition at Danforth Technical school, with shop, to cost $215,000, and a shop structure at Central Technical school, to cost $115,000.

CAP DE LA MADELEINE, QUE.—Municipal council is considering purchase of a centrifugal pump and a 100-horsepower motor. R. Morrissette is engineer.

LACHINE, QUE.—Bids will be received Feb. 19, by Hector Daoust, clerk, city hall, for construction of a pumping station and filtration plant. Equipment will be purchased. Estimated cost of buildings and equipment, $400,000. R. Dorion is engineer.

MONTREAL, QUE. — Power plant will be erected by Notre Dame hospital, 1560 Sherbrooke street. Plans are being prepared.

MONTREAL, QUE.—Canadian Aero Association Ltd. has been incorporated with 200 no par shares by F. R. Hannen, 500 Place d'Armes, to manufacture and deal in airplane engines and aircraft equipment.

MONTREAL, QUE. — International Equipment Co. Ltd. has been incorporated with 2000 no par shares by Kenneth Archibald, to manufacture and deal in railway, automobile and foundry supplies and equipment.

New Trade Publications

POWER PRESSES — Niagara Machine & Tool Works, Buffalo, has issued a bulletin describing and illustrating its eleven types of large and small presses.

FORGING MACHINES — Forging a piece weighing 105 pounds by internal displacement, to meet exacting requirements, is illustrated in a bulletin by the National Machinery Co., Tiffin, O.

REFRACTORIES — Leaflets by the Ironton Fire Brick Co., Ironton, O., cover three types of refractories for various uses.

FRICTION CHART—Bayley Blower Co., Milwaukee, is distributing a chart showing friction of air in pipes, with an explanation of its use in determining factors governing passage of air through pipes and ducts.

ELECTRICAL ACHIEVEMENTS — Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has compiled a record of its engineering achievements in the field of electricity in 1930, illustrated and each item described.

BLAST GATES—Ryan, Scully & Co., Philadelphia, has issued a bulletin, No. 7E, on its butterfly-type blast gate for control of air or gas. It is illustrated and contains tables of American standard pipe flange listings.

ARC WELDING SUPPLIES—Lincoln Electric Co., Cleveland, has issued a section for its loose-leaf catalog, Section 3304, on its arc-welding supplies. It covers welding rods, electrodes, holders and accessories. The various items are illustrated and tables give data and prices.

VULCANIZED FIBER—Continental-Diamond Fibre Co., Newark, Del., in a catalog of its fiber products, describes its manufacture and many of its uses in industry.

GRIZZLY LOADER—A folder, No. 256, by the Link-Belt Co., Chicago, describes its grizzly loader, built for rugged service and operated by one man, for loading rough and heavy materials. It illustrates the complete loader and various parts.

WORM GEAR SPEED REDUCERS—D. O. James Mfg. Co., Chicago, has issued a catalog covering four sizes of small heavy duty worm gear speed reducers, giving dimensions and horsepower ratings at various speeds. Numerous installations are illustrated.

ALLOY IRON—Patterson Foundry & Machine Co., East Liverpool, O., has issued a leaflet on its K/A alloy, a product of the electric furnace. It possesses great strength and toughness, uniform structure, low sulphur and phosphorus and great resistance to abrasion and corrosion.

WIRE ROPE—Hazard Wire Rope Co., Wilkes-Barre, Pa., has issued a folder presenting the advantages of a wire rope product made from 18-8 chrome-nickel stainless steel. Classes of service to which the rope is adapted are outlined, its construction described and its resistance to corrosion emphasized.

RESINOUS BINDER—A folder issued by General Plastics Inc., North Tonawanda, N. Y., describes a core binder incorporating a phenolic condensation product. Advantages in working and baking are outlined and a typical example of a core made with the binder is illustrated.

INGOT BRASS — Advantages and methods of preparation of ingots made by the Ajax Metal Co., Philadelphia, are described in a booklet recently issued by the company. Tentative specifications of 15 standard alloys adopted by the American Society for Testing Materials, with the recommendation of the United States bureau of simplified practice, are included and their advantages to producer and user emphasized. An appendix gives data on physical properties of standard alloys.

WELDED CONSTRUCTION—Lukenweld Inc., a division of the Lukens Steel Co., Coatesville, Pa., presents its welded construction in a current bulletin. In this method plates of welding quality rolled steel are cut to shape and welded, doing away with necessity for patterns and reducing cost of units in small quantity orders. Advantages of this method are described and adaptability to modern machine construction is stressed. A wealth of illustrations indicates the wide variety of uses to which this construction can be applied.